The Builder.

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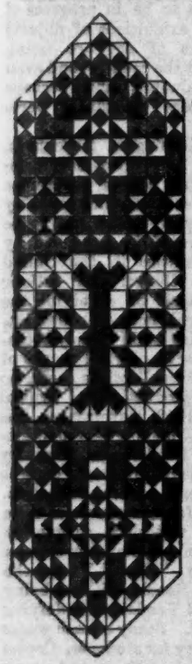
ILLUSTRATIONS.

South Lambeth Dwellings, Lambeth-road (with Plans).—Mr. E. Hoole, Architect 574, 576
Cathedral, George Town, Demerara (Double-page Engraving).—Mr. Blomfield, M.A., Architect 576, 579
Ground-plan of Cathedral, George Town, Demerara 581
Design for a Campo Santo for Interment and Cremation.—M. Adamczewski, Warsaw, Architect 583

CONTENTS.

A Burning Social and Industrial Question 561
The Educational and Technical Value of Public Collections 564
The Soil and its Influence on Human Health 565
Some Aspects of Hertfordshire 565
Typhoid Epidemic in London and a Proposal for a Graphic Indication of its Locality 568
The London Fish Markets Question 567
The Opening Conversazione of the Architectural Association 568
No more Railway Tunnels 570
Payments in Cash, Notes, and Cheques 570
The New York Metropolitan Museum 570
The Holborn Restaurant 571
The New Leipsic Concert Hall 572
Goethe's Monument at Cassel 572
The Cost of Ignorance 572
Gymnastic Hall at Brünn, Austria 572
Workmen's Dwellings, Plymouth 572
Value of Building Land at Thames Ditton 573
South Lambeth Dwellings 573
A Campo Santo for Interment and Cremation 573
Cathedral, George Town, Demerara 581
Southam 583
Index to the Minutes of Proceedings of the Institution of Civil Engineers 585
The Institution of Civil Engineers 585
Liverpool Engineering Society 585
The Great Eastern Company's New Bridge Works at Brick-lane 586
The New Royal Courts of Justice Chambers 586
The Late William Brodie, R.S.A. 586
The Late Mr. G. R. Pinnock 586
Friedrich Hitzig 586
Robert Hooke, Architect 586
The London, Chatham, and Dover Railway and the New Vegetable Market 587
Swindon 587
Palmerston Church 587
The New Wesleyan Chapel for Newcastle-upon-Tyne 587
Borough Engineers 587
Patent Record 587
The Victory over Sewer Gas 588
Coals for Domestic Fires in London and Coal Merchants 588
Paperhanging 588
Smoky Smells 589
The Gale of the 14th ult. 589
Hot-water Pipes in Libraries 589
Bromley Sewers 589
Accounts from Lightning in Germany 589
Testing Traps 589
Engineer and Contractor 589
An East End Bridge 589
Provincial News 589
Church Building News 590
Stained Glass 590
Books: Holoham's Book of Scales (Longmans) 590
Vertorium 590
The Tunnel under the Severn 590
Miscellanea 590



A Burning Social and Industrial Question.

IT is now some weeks since our attention was pointedly called, from a source very intimately connected with the direction of the scientific industry of Great Britain, to the problem, which was then felt to be about to become urgent, of the application of convict labour. The great works at Chatham and at Portsmouth, on which a large portion of such labour has of late been occupied, are at or about their close, so that the question, which is admittedly a very difficult one, calls for immediate attention.

The difficulties which beset this question may be classed as mechanical, moral, and economical. Of these the last are the most perplexing. It may be conceivable,—and we hope to show that it is very practicable,—to organise, under military guard, a system of convict labour which, to say the worst of it, cannot be more heavy on the operatives, or more difficult to guide within exact limits, than was the toil that erected the pyramids of Egypt. The moral objections apply chiefly not so much to an organisation of this kind, as to the employment of convict labour on the highways, or in any public situation, where the humiliation of the prison dress, the loaded rifles of the sentinels, or even the physical restraints upon the captives, may be thought to add appreciably to the sufferings, and, moreover, to harden both their hearts and those of the spectators of the toil. Of this we have ample evidence in Italy, where the spectacle of men in sulphur-coloured or red clothes, and even at times in irons, at work on the roads under the muzzles of the rifles of the sentinels, was not an unusual sight,—at all events, a few years ago. This difficulty, however, may be called a local one, and hardly arises except in case of such a wide distribution of convict labour as in itself is in many other respects unadvisable.

There remains the economical question: to wit, how far is it just to the ordinary labourer to affect the market demand for labour, and thus to lower, it may be, the ruling rate of wages, by the competition of labour which is in a certain sense gratuitous,—that is to say, of the labour of hands that must be fed and supported by the State, whether they work or not? And this objection applies with equal force to pauper labour. That it must be a serious difficulty is evident from the fact that, while the numbers of criminal offenders convicted, in 1880, in England, Scotland, and Ireland, amounted to 15,643, and while the able-bodied paupers, in the same year amounted in England to 111,169, and in Ireland to 9,278 (in Scotland the able-bodied paupers are not distinguished), such appeals as those which have been heretofore made in our columns as to the employment of wasted labour on "Lands that want Hands" have as yet failed to lead to practical results.

It is a natural suggestion that the employment of prison labour in supporting prison establishments, is a proceeding which is not liable to insuperable objections on either moral or economic grounds. But here come in what we call the mechanical difficulties, that is to say, within the precincts of the prisons there is only room for an employment of a limited number of prisoners, on such trades as they may be able to work in. There still remains a large bulk of convict population,—the whole number has been estimated at about 20,000,—for whom there is no indoor work. Are we, then, to regard these men as subjects for vengeance, or for reformatory treatment? That is the first question. They are sentenced to hard work. Well and good. But is that work to be of a brutalising or of an improving character? There is, we apprehend, little doubt that evidently useless work, such as the treadmill, or the shot drill, is the first. And we hold, believing in the nobility of work, that all distinctly useful work has in it something, however little it may be, elevating to the character of the workman. The most uninstructed agricultural labourer may rank very low in the scale of civilisation, but he stands on a step appreciably higher than that occupied by either the idle pauper or the convict on the treadmill.

If these views be true,—and we do not hold that they are either novel or debatable,—the question as to the proper mode of dealing with the large amount of convict and pauper labour which is likely to be absolutely wasted and lost to the country assumes the form of the least difficult of the three cases of dilemma. It becomes a mechanical difficulty where and how are these numerous strong men to be set to useful work, without either ousting the honest labourer, lowering his wages in the market, or presenting the demoralising aspect of men on whom our common burden,—that of working in some way for our bread,—is imposed under conditions that not only humiliate the worker, but degrade the dignity of work.

We venture to suggest a solution of this problem. The total area of bog in Ireland is estimated at 2,880,000 acres, nearly one-seventh of the entire surface of the island. Of these bogs there are 1,576,000 acres of flat bog, the remaining 1,254,000 acres are mountain bog. Without entering into chemical details,—which however, we are fully prepared to do,—we may state as an uncontradicted fact that nothing but well-directed labour is required to convert the greater portion, if not all, of that land, now waste, into the richest pasture or corn land. Drainage is the first, and in many cases the only, requisite, to effect this change. Burning the surface of the bog, after draining, has in some places had an admirable result. Claying the bog, by extracting the clay which lies below and forms an impervious bed, and placing it as a top dressing, is the method which has been followed in other cases, as in our own Bridgwater levels, with the result of turning waste swamps into the richest pasture or hay-growing lands in the kingdom. Whichever of these methods be adopted, there is the remarkable characteristic that only labour is required. No more capital is wanted than will suffice to feed the workpeople. In some cases, probably, steam-power would aid in the work of drainage. But even that would be fed from the spot, as the turf possesses very great advantages as a steam fuel if the flues of the boiler be designed properly for the consumption of turf. It is only last week than an "Ulster Landowner" writes to an English daily journal to say, "The great flat bogs, such as the bog of Allen, can no doubt be converted into most valuable land, but the expense would be great, and the work could only be undertaken as a whole, involving the execution of very great works. No owner of a few hundred or thousand acres on the fringe of the bog can drain this portion while tens of thousands of acres behind him remain undrained."

Here, then, are present all the elements for the solution of more questions than one. There is a great work to be done,—a work so large that it is beyond the reach of any private enterprise. Nor does it, for reasons into which it is unnecessary now to enter, present any temptation for joint-stock enterprise. On the other hand, it is a work involving immense national benefit. All neighbouring landowners would be enriched by the reclamation of this enormous bog. The island would have almost a new county added to its productive area. No money need be sunk in the bog. It is only requisite to apply to it that muscular force which is fretting itself into deeper poverty and misery by enforced idleness. Of course, proper engineering direction is required. But that is at the command of the Government. It is not necessary here to enter into any detail on that point. That the proper mode of attacking the bog is a matter for ready scientific determination every Woolwich cadet is aware. What is required is simply, enough labour under scientific direction As before said, it may be a question whether steam power may not be called in with advantage. No doubt, all pumping, if pumping be requisite, could be effected by convict or pauper labour, and would be self-supporting, or remunerative, if so effected. But when we consider that even the most clumsy and extravagant form of boiler will supply the power to effect this pumping at one per cent. of the cost of human manual power (taking that at the cost of wagon-filling on an English railway), and when we reflect that we want the work to be done, as

well as the men to be employed, we think no unnecessary strain should be put even on convict labour.

Local accommodation, such as our railway navvies are in the habit of providing for themselves, would, of course, be requisite. Proper military surveillance of the district and of the labourers would be essential. The mark system might be introduced, for the encouragement of the men; a certain number of marks having a definite time value for the shortening of their term of punishment, and even providing them with something with which to begin the world again when free. Not a single labourer in the three kingdoms could have a word to say, justly, against such a plan. The work is altogether unlikely, in our time at least, to be attempted in any other way. The result of it would be to provide an extended field for the labour of the Irish agriculturist. In most cases of any new industrial suggestion the *pros* and *cons.* are many, and it may be difficult to foresee which scale of the balance will descend. As to the reclamation of the Bog of Allen,—or, for that matter, of any other bog to be selected by the expert,—by labour that is now wasted or worse, we can see a great many *pros*; but we have to wait for an exposure of the *cons.* that cannot be met.

THE EDUCATIONAL AND TECHNICAL VALUE OF PUBLIC COLLECTIONS.

The practical value of public collections in the service of education is evidently taking a foremost place in matters of general public interest. From Classic times at least, the fashion of collecting has existed. Roman consuls furnished their houses with Greek works; Cicero condemns Verres, a governor of Sicily, for his wholesale seizure of precious objects made by workmen of Corinth and Delos. As Roman splendour declined so did early collections become dispersed in the misfortunes of wars and plunderings carried on by Huns, Goths, and Lombards. Until the Renaissance the practice of collecting lay in abeyance. Cola di Rienzi is considered to have revived it; but he is not credited with having had more than a desire to possess antiquities. His friend and admirer, Petrarca, was, it appears, more of an antiquary, having a keener insight into the virtues of works of art. Still there was scarcely a genuine amateur collector until the great Lorenzo di Medici arose. His times are marked by the establishment of the Florentine Accademia which he furnished with statues, busts, and other pieces of ancient workmanship. His school for sculptors stands high as having been the training ground of Michelangelo. Under Lorenzo's patronage a love for the fine arts seems to have spread with rapidity, and Italian artists and art-workmen soon abounded in great numbers, to supply the wants of their art-loving patrons.

In the antiquaries of the seventeenth and eighteenth centuries a sense of spreading some sort of useful and serious instruction was certainly alive. But even when Winckelmann produced his "History of Art," the value of technical teaching to artists and manufacturers in respect of materials and modes of workmanship does not appear to have been realised in this country. Prolix discourses by a Martinus Scriblerus, and anecdotes by a Horace Walpole sometimes still serve as models of style for the utterances of a few of our *virtuosi* and *cognoscenti*. The idea of giving to great numbers of persons some "technical instruction" by means of collections is virtually modern.

Much as individual curators and keepers of public collections have endeavoured to lay clearly-defined lessons before the public, Select Committees of the House of Commons and Royal Commissions will probably be the framers of schemes or *curricula* of instruction of which public collections are to be the exponents in this country. The British Museum was commenced as an emporium of things esteemed for being "rare and curious." It has in due course slowly developed branches which have some special knowledge in view, such as ethnology, archæology, natural history, &c. The National Gallery propounds a history of painting, the National Portrait Gallery tells us about portraiture, and the South Kensington Museum had for its mission at starting the culture of consumer's and producer's taste in the many ramifications of artistic handicrafts.

From the period of the Italian Renaissance to the present, the learned Müller has assigned three phases of people's appreciation of works of art. The first he considers is artistic, when "ancient works of art were taken up with joy and love, and collected with zeal,"—"there was little interest felt in them as historical monuments; enjoyment was the object." This period of sentiment, within the present century, finds many votaries. It is present in Shelley's apostrophe to a Greek vase. It is perpetuated by Mr. Ruskin, following whose lead is an army of disciples to whom "a thing of beauty is a joy for ever," and nothing more. The second period is the "antiquarian," when nomenclature of antique statues was much attended to. The basis of knowledge then put forth was antiquity rather than perception of artistic principles. The antiquarian period still survives. Müller's third period is the "scientific"; and this is marked by numerous attempts, philosophically and historically, to investigate art, "and to supply circumspect explanations of art." At the British Museum and the National Gallery there are evidences of this scientific period. At South Kensington the manifestations of its influence are just now various.

For some years the collections at the Kensington Museum had for their aim what appeared to be the technical explanation of the industrial arts. The museum was started on grounds totally distinct from those of any existing public collection. It did not concern itself with either ethnology or archæology. The backwardness of our artistic manufactures was a cause of its creation. The country seemed to have awakened to its want of instruction as to how materials had been used and the different processes which had from time to time been employed in the production of works of art. And so South Kensington Museum came into being, to tell artisans and designers, their employers and customers, what had been done, and was being done, in artistic handicraft. "Technical instruction" was an officially used term in 1852. When Marlborough House contained the nucleus of the present inestimable collections belonging to the South Kensington Museum, a system had been devised for acquiring objects which, in the first place, were to be of "technical (manufacturing) or scientific interest." The generic divisions of the collections so formed were to be ruled as far as possible by character of materials,—like wood, stone, glass, metal, &c.; whilst the *species* of these generic divisions would be "the technical embodiment," or processes, "as, for instance, cast, hammered, moulded, carved, blown, &c." Date, local origin, &c., were of subsidiary importance. Besides this carefully-considered scheme or policy for the formation and arrangement of the Museum, classes existed for giving "technical instruction" in various branches of art. These classes were the offspring of the older schools of design, the reports upon which, dating from 1841, are devoted to the establishment of a system of practical and technical instruction in the fine arts. At Marlborough House, Professor Semper taught practical construction, architecture, and plastic decoration. He and his students had an opportunity of showing their skill when they were charged to execute the ornamental metal work for the funeral car of the Duke of Wellington, which is now shown in the crypt of St. Paul's. Then there were other classes for teaching the principles and practice of ornamental art applied to surface decoration, including woven fabrics, paperstaining, embroidery and lace-making, porcelain, &c. These were conducted by the late Mr. Octavius Hudson, whose name as a nineteenth-century purist in Gothic decoration is associated with restorations at Lichfield, Ely, and the Lady Chapel of Chester Cathedral. But these classes for "technical instruction in art" have fallen into comparative desuetude. Perhaps the City Guilds' new Technical Institute may revive them. In any case, however, they are beside the immediate question of the technically instructive value of the collections at South Kensington.

This question may possibly attract a lion's share of attention next session from the Select Committees who propose to formulate the educational and technical functions of public collections generally. This possibility is all the more likely if a glance be taken over the numerous sections of which the South Kensington Museum is now composed. Its main buildings contain all sorts of works of fine art, paintings, sculptures, pottery, furniture, glass, textile fabrics, metal works, ivories, &c. In annexes are materials for building construction, models of machinery and of ships, a piscicultural collection, scientific instruments, educational apparatus, to say nothing of an immense department devoted to Indian art. This apparent complexity of collections is astonishing when disconnected from antecedent causes of its development. As a step towards elucidating its meaning, the collection of modern small arms and ordnance has recently been dispersed, a portion going to Birmingham and another to Sheffield. The collections of building construction, an intelligible evolution of the technical classes held under Professor Semper, are, it is reported, to be broken up. Besides these clearances, changes and developments are going forward in other parts of the Museum. The collections of works of art are undergoing re-arrangement. The old classification by materials and processes is being undone, and heterogeneous gatherings of works assumed to have been produced in various countries are taking its place. A museum of casts, for some years a dream of the Duke of Westminster and Lord Cowper, has been announced by Mr. Mundella to be in progress of formation. Special loan exhibitions of objects to show national phases of art are being organised; and throughout the country, and even abroad, all sorts of valuable, and perhaps unique, works of art are constantly peregrinating.

The functions of the Kensington Museum in circulating works of art have often been commented upon. They would appear sometimes to derange the normal collections which probably deserve a grant of fixity of tenure not to be impaired by perils of travel by land and by water. Hundreds of localities in the United Kingdom, awakening to the cry for artistic technical instruction, cannot be eager for the disintegration of a central normal collection. To a small extent, localities could supply themselves and be supplied with original works of art, and the hiatus in their collections could, no doubt, be filled with reproductions of typical famous works. From 1842 Government has acknowledged the value of making reproductions of works of art. It was felt to be as necessary in responding to the wants of provincial centres as to those of a normal central collection. National monuments in foreign countries were not purchasable. Even victorious conquerors could not transport Trajan's column, the Bayeux tapestry, Michelangelo's "David," or the Bhuddist gateways from Sanchi, without being reprobated for their acts of Vandalism in defying the spirit of modern right. Study of such works was none the less necessary for students. Copies were accordingly obtained of them and many others; and the system was ratified by a convention or agreement for assisting the making of copies, which was entered into by the Prince of Wales and the princes of the reigning houses of Europe in 1867. The copies, as obtained, took their places amongst original objects, and representative series of works in various materials were thus formed. This aspect of the utility of reproductions is now undergoing modification. The copies are no longer in the ranks of the general series of works. They are brought together by themselves and are destined to become the nucleus of a "Museum of Casts." The project of a museum of casts is adopted from cognate collections at Berlin and Munich. Its achievement will be advantageous to students of historical art, and will result in forming an adjunct to a museum of industrial fine art. It will, however, be independent of artistic technical collections for the instruction of producer and consumer. Points like these seem to fall within the scope of the inquiries of the Royal Commission now engaged upon furthering technical education.

Up to about 1876 the administration of the Kensington Museum had endeavoured to classify sections of objects in accordance with the principles enunciated in 1852. An unexampled collection of works of the potter's art was arranged: goldsmiths' and jewellers' works were placed together, carvings in wood and cabinetmakers' work formed another section, metal works another, textile fabrics another, and so on. The handicraftsman pursuing his industry in one or another of such divisions, could come to South Kensington and consult the works which belonged to his craft. From time to time there had been special exhibitions of works of various crafts. There had been one for cabinetmakers, a later one for embroiderers, another for jewellers, another for enamellers. During this year, a different series of exhibitions has been commenced. Spanish and Portuguese works were collected; and probably Scandinavian,

Italian, French, German, Russian, Chinese, and American collections may follow. The aim of these national exhibitions is apart from that of the preceding "craft" exhibitions. Their importance lies, in enabling connoisseurs and amateurs, as distinct from artisans and manufacturers, to discuss the nationality of art works. An ethnical interest is thus appealed to. For instance, in the Spanish and Portuguese exhibitions, there were splendid embroideries which Oriental travellers pronounced to be from Persia and Goa. Ornate plate was by some held to be Flemish. Finely-chased salvers, marked even with the Medicean "palle," were declared not to be Italian, ivory carvings were known to be French Gothic, and many delicate enamels, usually considered to be "Cellini" work, were placed in the Spanish collection, although labelled as being of French or Italian origin. Hence many inducements were offered for interesting controversy upon what could be the appreciable characteristics of "Iberian" art.

The theory that art is to be nationalised is gaining ground, and the arrangement of objects at South Kensington is being attempted in this direction. Its logical basis may be questioned by those who recall the dissemination of styles of art throughout Europe, which followed from the journeys of artists like San Gallo, Torrigiano, Cellini, Holbein, and many others. Into a large court have lately been brought sculptures in marble and stone, modelling in terra cotta, enamelled earthenware, furniture, plasterwork, metalwork, glass, &c., all considered to be of Italian work. As in the case of the reproductions and casts, technical arrangement showing crafts becomes superseded by "national" or "ethnical" arrangement. From this point of view the instructive purposes of the South Kensington Museum might be deemed to be entering a new phase. This new phase may be strange to foreign countries, who, struck with admiration of the original intention of the Kensington Museum, have been devising the establishment of "Industrial" museums for the artistic technical instruction of their artisans and manufacturers. As we write, the final arrangements are reported to be in progress for inaugurating at Berlin a German copy of our South Kensington Museum. This Berlin Museum is to be an Industrial Museum based upon what were the ruling principles of the South Kensington Museum before the present idea of converting it into a Museum of Ethnical Arts had taken root.

Our national collections, regarded as accumulations of materials for educational purposes, may be likened to the storage of facts possessed by a teacher. How they are to serve in special branches of instruction depends upon the teacher's treatment and presentation of them to the public. Study of archæology, ethnology, mineralogy, palæontology, ornithology, animal physiology, and technology, may each be advanced if the facts concerning them are kept in orderly and immutable arrangement, subservient to the particular branch of knowledge concerned. To aid the popular perception of such principle will, no doubt, be a chief object with the Select Committees next year. Museums should not, chameleon-like, be allowed to change their colours. The "circumspect explanation" of objects in public collections, and the definition of the precise *educational* purpose of each collection, are of public importance, and may be advantageously taken in hand.

THE SOIL AND ITS INFLUENCE ON HUMAN HEALTH.

At the recent meeting of the German Society of Natural Philosophers and Physicians at Saltzburg, the eminent Dr. Pettenkofer read a valuable paper on the subject of the influence of the soil upon human health. The subject, he said, was one of the oldest in sanitary science, but it possessed of necessity a permanent interest, as it was constantly presenting itself under new aspects. The soil, the air, and the water had been from time immemorial regarded as the principal factors in the problem of the salubrity of localities. It was these which made a place healthy or the reverse. In recent times there had, in Dr. Pettenkofer's opinion, been a tendency to look too exclusively to the air and water, and to neglect the influence of the soil in sanitary questions. But the ground on which men built their houses, and on which they passed their lives, must always take a pre-eminent place in the determination of all sanitary problems. Dr. Pettenkofer pointed out that air is almost invariably in motion. The average speed at which it moves over the ground at the earth's surface is about 10 ft. per second. Even in a so-called calm, the air is not still; it is still moving at the rate of about 1 ft. 6 in. per second. Hence, even in abysses, and the most secluded valleys of the country, or the narrowest lanes of cities, the air is never really stagnant. Nearly the same may be said with regard to water. All water as it falls from the clouds is of nearly homogeneous composition. It is but very slightly impure. From the soil, however, water, like air, takes up certain impurities. These are generally removed from the air much more quickly than from the water. The circulation of water and its purification from foreign elements are more complicated and less expeditious matters than in the case of air. Nevertheless the process of purifying water goes on even in the drains and sewers of cities, but more especially in the great natural drains, the rivers,—like the Isar, at Munich; the Elbe, at Dresden and Hamburg; the Thames, at Oxford and London; or the Seine, at Paris or Rouen. It was in the soil that impurities were most obstinately and longest retained. The influence of the soil showed itself most clearly in the case of epidemic diseases. Malaria has always been recognised as dependent on the soil of the localities where it is found. But it was not less true that cholera, typhus fever, yellow fever, perhaps even the plague itself, likewise depended on, or were connected with, the condition of the soil. What we have still to settle is the question, "How?" It has been attempted to explain the epidemic appearance of such diseases by assuming that they were propagated through the air or water, or both. But it is incorrect to regard either air or water as the true cause of epidemics. This is generally to be found in the soil. One proof of this Dr. Pettenkofer found in the fact that ships at sea were inaccessible to cholera. It had been observed that when persons were attacked by cholera on the high seas, only those who came from the same localities caught the disease, while the other passengers escaped. It was only exceptionally that the epidemic broke out on board a vessel, and then only when the passengers and crew were in frequent contact with an infected locality on shore. But even on land there were places safe against epidemics. Thus, Lyons, in the south of France, in spite of its large traffic with Paris and Marseilles, where cholera was raging, remained free from the disease. The only explanation that could be found was the condition of the soil or ground at the former city. Still more surprising was the immunity of Versailles from cholera, when Paris, with which it was in constant and immediate communication, was the scene of an outbreak of that epidemic. The investigations of the German Commission on Cholera have clearly shown that epidemics are localised, and that they are caused by the condition of the soil.

What is that, asked Dr. Pettenkofer, in the condition of the soil which is able to produce such an effect upon the health? He answered that probably it would be found in a vast number of minute infinitesimal organisms,—so minute that millions of them might, if collected, lie on the head of a pin. Dr. Nägeli has distinguished such organisms, and presented a faithful and vivid picture of them as they rise from time to time out of the ground. He makes a distinction between soil that is pestilential or unhealthy, and soil that is healthy or free from pestilence. This distinction does not coincide with the presence or absence of a certain kind of fungus, as this is found growing everywhere. However, if the disease is attributable to the same species of fungus generally found growing in every place, then the same forms of these little organisms must produce different effects under different circumstances. It is the task of hygienic science to examine the conditions of the soil favourable to the development of these organisms and their entrance into the human system. It has long been known that by means of drainage and cultivation or tillage an injurious unhealthy soil, like that of the malaria districts, may be deprived of its dangerous character. Even in ancient times canals were cut by the Romans in order, by drainage, to reduce the evil effects of the malaria, though these works had subsequently been destroyed and forgotten. Certain diseases have their favourite haunts in alluvial soil on account of the porous nature of that soil. The spaces and interstices of this soil favour the circulation of air and water. But the same may, to a certain extent, be said of some kinds of porous rock, as is proved by the appearance of cholera in rocky places like Malta. Exact investigations respecting the air in soils have shown its importance from a sanitary point of view. On thoroughly dry soils the ground-air does not absorb any more carbonic acid or organic matter than the air above the ground. This has been shown by experiments with the air brought by Dr. Zittel from the Libyan Desert. The subterraneous or underground air circulates in the soil, although but slowly. During the greater part of the year it penetrates into badly-built dwellings, and conveys into them the fungous germs of disease. In this manner the soil influences human health, and there are only too many dwellings subject to this influence, which is the more baneful the worse they are ventilated. Our houses, in fact, draw or suck the air out of the ground like so many cupping glasses. From a hygienic point of view they are, indeed, less rational than the old pile dwellings of primeval humanity, or than even the village cottages of the present day, whose floors are covered with mud plaster. This was illustrated in the case of an outbreak of cholera at Dantzic, where out of a group of nine cottages, seven modern-built ones, with cellars and plank floors, were visited by the epidemic, while the only two with mud plaster escaped. Accordingly, it appears that in our houses we must pay more attention to the soil on which they are built. Such arrangements should be made in their construction that we should no longer be compelled to take to flight when an epidemic breaks out. A proper method of sanitary construction would enable us to withstand successfully a siege, so to speak, by the cholera, in which case it could be said with greater truth than ever that "a man's house is his castle." Dr. Pettenkofer regards it as the duty of Governments to take the initiative in this matter. Not less important than the air is the water. All organisms require moisture. There are two degrees of moisture to be distinguished: first, that in which the pores of the soil are occupied by air and water in common; and, secondly, that in which the water has entirely driven out the air. In the first case, we have a damp soil; in the second, we have underground water. The intimate connexion between typhoidal diseases and the underground water has been long recognised. When underground water rises higher than the average, typhus disappears, but when again the water in question sinks below its average level, typhus increases. This had been shown clearly by observations made in Berlin. Any apparent exceptions such as places visited by typhus, though without underground water, yet having a porous soil, or again the unimportance of the level of underground water near rivers, did not invalidate the argument. As, amongst us in Europe, the abdominal typhus fever depends on the rainfall and the level of the underground water, so in India does the cholera depend precisely upon the like causes.

With regard to the theory attributing cholera, typhus, and all zymotic diseases mainly to the water we drink, Dr. Pettenkofer advanced some arguments against its unconditional acceptance. The malaria poison, for instance, does not enter the water. The *baccillus malariæ* has been proved to be an organism living in the air, not in the water, of the infected districts, and it was from the air that they penetrated into the human system, and ultimately into the blood. The real cholera germ has not yet been accurately ascertained or identified. It is still doubtful whether it is disseminated more by water than by air. The drinking-water of places visited by cholera has often been entirely given up without preventing the re-appearance or continuance of the epidemic. The city of Basle, for instance, possesses the purest drinking-water which is brought down from the Jura, but has not been protected by it from the disease. Dr. Pettenkofer, however, would not question the importance of the water we drink, in regard to this question. Far from denying the value of good waterworks, the speaker dwelt on the importance of pure drinking-water. The *bacteria* question, too, was one of the highest importance, but the theoretical deductions on that subject required to be practically employed and confirmed by practical experiments. To the observations of a Pasteur there needed to be added the practical applications of a Lister, in order to make them of value in sanitary or surgical science, and in the same way mykological investigations would require to be completed by

hygienic researches. It had been observed that in the case of very concentrated and very diluted fluids used as nutriment, the very small organisms usually found in those fluids in their normal condition are destroyed. An inference drawn from this, that dirt is no danger to health provided it be only thoroughly concentrated dirt, could not be admitted. In villages the dirt is not stronger or more genuine dirt than in towns. In the latter it is only covered up more, and, therefore, the more dangerous. In villages, too, the more cleanly dwellings were the healthier. But granting that concentrated dirt may hinder fungous vegetation, there still remains for hygienic science the task of ascertaining what must be the proper degree of this concentration, and to consider the conditions favourable to the injurious vegetation in question. Sanitary science was, in fact, one unceasing battle against dirt. As the growth of these minute fungi is increased by moisture, it might be thought that all would be right if everything were kept from the damp. However, we are not able to prevent everything from becoming damp or to prevent the dissemination of germs in a thousand different ways. It is in any case good to avoid or to draw off moisture. Dr. Pettenkofer strongly condemned the use of ground reservoirs for rain-water and other such pits, as they contribute to keep the soil thoroughly moist, and are thus very injurious in the neighbourhood of dwelling-houses. They serve, in fact, precisely like a sort of artificial inundation.

The doing away with the moisture or dampness of soils, or at least the diminution of damp, is the main advantage of the various systems of drainage. The value of drains might be exaggerated, but we must beware of underestimating them. Statistics prove that every city which has laid down a system of drainage has greatly benefited thereby. Further, Dr. Pettenkofer referred to the self-cleansing process going on in the soil through the agency of certain very low organisms. The formation of saltpetre through certain fungous growths, shows that these minutiæ are capable of acting not only injuriously, but also beneficially. Hygienic science, at the present moment, stands in view of a practically boundless world of possibilities. But this must not discourage us from action. Hitherto hygienic science has been guided chiefly by feeling, instinct, and so-called commonsense; it is only recently that it has been established on a scientific basis. Cleanliness plays in public life an important part. Cleanly persons live longer and more healthily than the dirty. We ought to respect the sanitary system in common use, even though it still lacks a scientific foundation. But scientific criticism is necessary to refute false ideas, and to get rid of what is superfluous and hurtful. In conclusion, the speaker said that the advancement of sanitary and hygienic science, both in theory and practice, was one of the most important duties of the State.

SOME ASPECTS OF HERTFORDSHIRE.

The very fact that Hertfordshire is so close to London helps to make it different from other counties, for it is the immense contrast between a very rural county, such as this, and an enormous metropolis within half an hour by rail, that furnishes it with a noticeable characteristic, that is to say, its metropolitan but thoroughly rural nature. For there are few counties in England in which, as a whole, there is a larger proportion of woodland, or which are more thickly wooded. From Hatfield to Hertford, for example, the eye is struck with the continual woods, and with roads and lanes overshadowed by innumerable well-grown oaks. Equally also the picturesqueness of the villages, the many cosy red-brick old-fashioned houses, half hidden by clematis and roses, which are to be found throughout the county, help to make the contrast more marked in the mind of any one who, a short time before, has left the metropolis, between this rural county and the great town which is so near. But whilst this is one of the general aspects of this county, it is one which, while it will strike an intelligent man who may or may not be an architect, yet is not that aspect of it which principally makes Hertfordshire, as a county, of very considerable interest to the architect, and especially the young architect. For Hertfordshire is, if we may coin a phrase, essentially a "residential county." It is quite astonishing to see the number of gentlemen's residences which are passed mile after mile,—not lordly palaces, such as Hatfield, which, we need not point out, is a unique and an historical palace, but fair-sized "mansions," standing in well-kept and bright gardens, in small parks, or in park-like land. If a young architect were to start from Tring in the west, and go directly pretty nearly through the middle of the county to Sawbridgeworth in the east, he would see more examples of what may fairly be described as averaged-sized gentlemen's houses than in any other county in England. As we have already said, we exclude from this the great and noticeable house of Hatfield, which all young architects should visit, and even great but lesser houses, such as Panshanger, looking down from its trees over the green slopes and shining Maran as it sweeps beneath the dark green oaks or broadens into the quiet lake reflecting the overhanging trees and the stately swans, or Knebworth with its twelve fantastic vanes. *Apropos* of this house there is a story that the late Lord Lytton used to delight to take his guests outside the house and ask them to count the weathercocks, and when they could only make the number twelve, he would add that there were thirteen, and that the thirteenth was himself. But the number of the average houses, and the singular fitness of the country, with its wooded knolls, its grassy slopes, and its abruptly undulating nature for residences, will make a journey through Hertfordshire a very profitable one to an architect who goes with his eyes and mind well open. He will see much that he may usefully imitate, and much also that will show him what to avoid; he will see many instances of good, and not a few examples of bad taste in building. He will notice houses placed on spots which there can be no question should have been avoided, and others placed with excellent effects, both as regards picturesqueness and health. Here is a handsome house put right at the bottom of a slope, where, if a fog is to be found, it will certainly exist, without a view, and which cannot be reached without a rapid descent, nor left without a tedious ascent. On the other hand, he will see a similar house placed just below the topmost swell of the hill, which shelters it from the winter winds with a garden beginning the slope, which broadens out into a smooth green descent studded with well-shaped trees, which in its turn draws the eye to the lower slopes, and the misty distance. He will notice one house with a northern aspect, as if the owner, and all who came after him, were disciples of the late Canon Kingsley, and desired to get each blast of the cold winds, and not the gleams of sunlight which make a southern aspect so precious in the winter season, and, indeed, for the greater part of the year in this not too warm land of ours. These are some of the points which will strike the architect who wanders through Hertfordshire, but even where there does not happen to be a house situated, there are so many spots on which a house might well be placed that the county affords, as it were, lessons in the placing of houses which, if carefully taken to heart, can scarcely fail to be of value when the architect has to advise on the situation of a house in a neighbourhood less fitted for houses than Hertfordshire, because the eye, getting familiarised with what auctioneers term "eligible sites," at once picks out the best position when a spot has to be fixed upon in some other part of England.

Equally also the number of the houses makes it possible to notice secondary matters, or rather matters of detail, so to speak, such as the position of stables, one of the most difficult points in regard to country-houses; for it is so common to find the stables too close, or, on the other hand, too far, and the means by which they shall be at once handy to, and yet removed from, the house, is often a difficult practical point. Again, few men wish to spend a large sum on the decorative effect of stables, and yet no man of taste wishes his stables either to be out of keeping with the house of which they form a part, or so absolutely without beauty and architectural fitness as to be positively an eyesore. Thus passing from one house to another in Hertfordshire, lessons can scarcely fail to be learned in regard to this eminently practical point which so often gives no little trouble to both architect and owner. In the same way Hertfordshire affords an easy study of lodges and gardeners' cottages, which, again, are buildings in erecting which economy and harmony generally have to be united. These are all matters which affect the architect very seriously, professionally, and may do much to make or mar the beauty of our English homes. When, therefore, we get a county so rich in natural beauty, and a beauty of a peculiarly English character,—one, too, essentially very fitted to the habits and the desires of the man of means, or of the country gentleman of the present day, who makes his home in the country—so near to London, so easy of access and study, so well covered with houses, from an ancient palace of the Tudors to the modern dwelling-house of the Australian merchant,—it may fairly be said that Hertfordshire is most interesting to all architects, and especially to those who are at the beginning of their career.

TYPHOID EPIDEMIC IN LONDON, AND A PROPOSAL FOR A GRAPHIC INDICATION OF ITS LOCALITY.

The *Lancet* calls attention to the fact that a severe epidemic of enteric fever is prevailing in London. In the week ending the 22nd of October there were fifty-three fatal cases, or thirty above the corrected average. The general hospitals contain an unusually large number of cases, and at some of the hospitals many applicants have been turned away. The fever is of an unusually virulent type. We call upon all such friends of sanitary reform as may be able to contribute any information, to give their attention to the subject of a monthly Disease Map of London. It would be easy to construct such a map, if reports were drawn up at the hospitals, dividing the patients, under each head of disease, according to the locality from which they come. It would then at once become evident whether any epidemic of the kind were local or general. If it proves that the cases are equally distributed over the area of London, it will be evident that it is by attention to the general rules of health that the danger is best to be met. But if it prove that certain localities are most affected, an indication of the utmost sanitary value will be afforded. The block map on which the monthly states are laid down should distinguish the districts of the different water companies, and also those of the different principal sewers by which the area is drained. Thus, when the Homerton district is indicated as containing numerous cases, the first remark is that the water is supplied to it by the East London Water Company, the second that it is drained by the Hackney Wick Branch sewer. Furnished with this guide, the observer who has the localities of the different cases attacked to mark on his map will be at once enabled to see whether it is to the water supply or to the drainage that he is to look for the immediate causes that aggravate the epidemic. If it should prove that the Kingsland-road forms a boundary east of which fever is manifestly more prevalent than westward of that line, a significant suggestion for inquiry will be given as to the effect of the use of the river Lea water. If the depression and outfall line which runs southwards from Upper Clapton to the north loop of the Thames near Poplar, prove to be the axis of the densest part of the map, it will show that the Metropolitan drainage system has to be overhauled. If the cases follow the run of the river, the effect of the wholesale pollution effected by the present arrangements may become evident. In such a case it would be worse than idle to express any anticipation, except one, and that is, that the information which such a map would afford at a glance would be of the utmost sanitary value.

If nothing points to district causes of disease, such as those arising from bad water, bad drainage, bad milk, or overcrowding, the need will be only the more apparent to seek for and root out such nests of fever as have been recently identified in Marylebone, for example, by a coroner's inquest, held on the 27th ult. The facts put in evidence at that inquest are of a distressing nature. Not only so, they are of a nature very alarming for the vicinity. However charitable any locality, or any class of society, may be, there can be no doubt that at the same time a stimulus to charity and a guide to the directions in which it may be most usefully applied would be given by such maps as we suggest. A certain number of fever cases coming from a certain locality would at once direct attention to that locality, if the cases were graphically referred to their proper districts. The aid of the local medical officers of health would be invoked, and the map would thus be completed, not from hospital returns alone, but

from all that comes within the purview of the Registrar-General. And when those persons who are unconsciously living in danger of infection from neglected neighbourhoods, or from the hopeless misery of silent poverty, had it once brought plainly before their eyes what was the sanitary state of their neighbourhood, the very instinct of self-preservation would be awakened, and the local medical men would be likely to obtain an aid to their disinterested exertions that would prove of the utmost value, both in relieving misery and in preventing the incubation, spread, and seeding of infectious diseases.

The idea of a disease-map, as our readers may be aware, is not new. Some years back we called attention to the great value of the scheme when introduced by a medical officer of the navy; but these maps regarded the normal distribution of diseases in the country. They showed, for instance, how consumption haunts wet subsoils; how rheumatism lingers in mountain valleys and in the hollows of the chalk uplands; how certain localities are favourable and others unfavourable to heart-disease. We do not undervalue this study. On the contrary, we think it is one that should occupy a large space in the attention of every medical man.

But what we now suggest is of a different nature, although quite in harmony with existing disease-maps. The difference in the two cases is such as that which exists between a general statement of average barometric readings over a given country, and a daily or weekly statement of barometric readings in each given locality. Our disease-map would resemble the latter. Its value would be double. First, it would be a guide to the expert; secondly, it would be a warning to the inexpert. To the first it would show where to set to work in order to insure safety; to the second it would furnish a strong incentive to give substantial aid to such work.

THE LONDON FISH-MARKETS QUESTION.

After a debate lasting nearly five hours, on the 28th ult. the Metropolitan Board of Works, by a very narrow majority, has sought to shelve the question relegated to it by the Home Secretary,—at any rate, for the present,—for by adherence to the decision unexpectedly arrived at the Board would preclude itself from taking the necessary steps to promote a Bill in the next session of Parliament which should confer upon it the necessary powers to erect a fish-market or markets, although by a resolution arrived at more than three months ago, they unanimously pledged themselves to this course. Those who listened to the debate could not but be struck by the persistent manner in which the majority of the members, while (with one or two exceptions) admitting the necessity of something being done, contended for the adoption of sites in localities with which they happened to be more particularly connected. They did not take a broad view of the wants of the metropolis as a whole. It was alleged by the opponents of the particular site recommended for adoption by the Works Committee (*i.e.*, the site in Blackfriars-road), that its selection had been precipitately determined upon in order that the Board might be able to go to Parliament and score a victory against the Corporation, and we fear that this charge is not altogether baseless; for, whilst some of the speakers disclaimed any desire to "disestablish and dis-market Billingsgate," there were others who boldly announciated the view that they hoped the action of the Board *would* do away with the old market altogether, on account of its smallness of area and the difficulty of approaching it. The speakers who were against the adoption of the Committee's report, in support of their view that the recommendation contained in that report was hastily arrived at, and therefore ill-considered, urged that the fact of the Board's selection of one site after another was a proof of indecision. One of the speakers, who advocated the erection of a fish-market in York-road, King's Cross, sought to show that this point was the centre of the metropolis, and he tried to convince the Board that his knowledge of the topography of London was exact by the simple expedient of drawing on the map a circle radiating from King's Cross as a centre! In this way it would be easy to show Hyde Park Corner, or the spot whereon once stood Mile-End Gate, to be the centre of London. The same gentleman, arguing against the Blackfriars-road site,—not only because it was not, in his opinion, sufficiently central, but because the direct railway route to it was through the heart of London, *viâ* the Underground Railway from King's-cross to Farringdon-street and Snow-hill, and thence by the London, Chatham, and Dover line *viâ* Ludgate-hill and Blackfriars,—spoke of the deleterious effect upon the fish of the air of the underground railway; but seeing that the transit of the fish-trains underneath London would take place mostly in the early hours of the morning, and that their passage from King's-cross to Lodgate-hill would occupy not more than ten minutes, and remembering that fish-trains from a distance have to pass through longer lengths of tunnel on some lines, there does not appear to be much in that argument. The same must be said as to the difficulty which the speaker conjured up of fish-trains being unable to reach the proposed market in Blackfriars-road owing to their inability to ascend the steep incline between Snow-hill and Ludgate-hill stations. It is true that the gradient referred to is a heavy one, but nevertheless, heavier goods than fish, viz., coals, are hauled up it, on their way south, by thousands of tons every week,—to an extent, indeed, only limited by the exigencies of the passenger and mixed goods traffic. The several companies having running powers over this bit of line "shove through," in the words of one of the station officials, as much coal as ever they can, and would "shove through" more if they could. A point that might well have been taken against the proposed market in Blackfriars-road, if it had depended for its railway service entirely on the railway *viâ* Farringdon-street and Ludgate-hill, is the already exceedingly-congested state of the traffic on the line; but, as a matter of fact, *détours* to the west and south-west, *viâ* Kensington and Clapham Junction, and to the east and south-east, *viâ* the Thames Tunnel and New Cross, would enable fish-trains coming from the north or north-east to reach the Chatham and Dover line south of Blackfriars Station without passing through the City at all. It was the primary object of the supporters of the Blackfriars-road site to erect there a market which should mainly, if not entirely, receive the railway-borne fish entering the metropolis. Indeed, the site, being to the south of Southwark-street, has no river frontage, although, it was suggested, a wharf for the landing of water-borne fish might be established in the neighbourhood of the railway bridge, and the fish there landed conveyed into the market. Now the evidence of fishermen, smack-owners, salesmen, and others is unanimous in at least one point, and that is, that the railway companies' charges for the conveyance of fish are so great that what is called the "offal" fish,—*i.e.*, the fish which is most abundant, and therefore most within the means of the poor to purchase, if it could only be got to London in sufficient quantities,—will not bear the heavy cost of railway carriage, and so, we learn that, although the "harvest of the sea" is abundant, hundreds of tons of sprats, herrings, &c., can be put to no other use, when caught, than to manure farm lands. In view of this fact, it was very well pointed out by some of the members of the Board that whatever market might be established for the reception of railway-borne fish, it was eminently desirable to provide new, or at any rate to preserve existing, market accommodation for water-borne fish, and to encourage the growth of the traffic in such fish, in order to compete with the railway companies, and so, possibly, induce them to lower their rates of carriage for this important article of food. "A railway manager," said one of the speakers, "is a man without a conscience," and for this reason it was urged that whatever was done the Board should give no encouragement to railway monopolies. Another speaker put this case:—Assuming a new market for railway-borne fish to be established in Blackfriars-road, and that Billingsgate, enlarged and with improved approaches, would receive the water-borne fish, would not the retail fishmonger carrying on business, say, at Kensington or Bayswater, be under the necessity, in order that he might buy in the most advantageous market, of visiting first Blackfriars-road and then Billingsgate, or *vice-versâ*, to his great loss of time and the increase of the traffic over the bridges? Answering this question in the affirmative, the speaker proceeded to argue in favour of a market which should be capable of receiving both the rail-borne and water-borne fish, and such a site, he pointed out, was the one at Bankside. Doubts were expressed whether the proposed market, or any new market, wherever placed, would be a success, for it was truly said it is much easier to erect a building for a market than to create a market itself in a new locality. Columbia Market was instanced as an illustration of this. Many side issues and details not affecting the main question were incidentally raised, and one of them was whether, in the proposed market, it was advisable to have retail shops. Retail shops in a city market, said the member who has been quoted as having no very high opinion of railway managers, were vestiges of the time when Materfamilias lived in town and used to do her own marketing. The City had ceased to be a place of residence, and had become "the mere battle-field of avarice."

The whole question, as is evidenced by the able reports of the Engineer and the Superintending Architect of the Board, is one demanding great care in the attempt at a solution. The matter is again to come before the Board, but it must not be forgotten that it is still under consideration by the Corporation of London, who may possibly take such steps in the near future as to greatly diminish, if it does not entirely remove, the necessity for the Board's taking further action in the matter. Should this be the result of the "late-present" agitation on the subject, it will be, as was hinted during the debate, a tribute to the astuteness of the Home Secretary in using the Metropolitan Board of Works as a lever to move the Corporation of London.

Shortly stated, the course of the debate, of which we have reviewed the leading incidents, was this:—The Works and General Purposes Committee presented a report, in which, after weighing the merits and demerits of various proposed sites, they recommended the Board to approve of the site in Blackfriars-road suggested by the Engineer and Architect, and to apply to Parliament in the next session for power to acquire that site for the purposes of a fish-market. This site, about six acres and a half in area, is traversed from north to south by the London, Chatham, and Dover Railway, and has its main frontage to the east side of Blackfriars-road (extending from Southwark-street to York-street). It is estimated to cost 530,000*l.* to acquire. The erection of the market buildings, and the necessary arrangements for the bringing the fish-trains into the market, are estimated to cost 300,000*l.*, so that very nearly a million of money would be required to carry out the scheme. The chairman of the committee moved the adoption of the report, whereupon an amendment was moved to acquire a site in York-road, King's-cross. This amendment was duly seconded, and after a long discussion, a show of hands was taken, when the amendment was rejected by 25 votes against it to 4 for it. Another member then moved, as a rider to the original motion, "That the Board do also provide a site at Shadwell for a fish-market, and that the Board apply to Parliament for powers to make a waterside fish-market on the site referred to." This proposed addendum was rejected by 18 votes to 9 on a show of hands, and by 21 to 9 on a division. On the original motion, for the adoption of the report of the committee, being put to a show of hands, there appeared: For the report 17, against it 16, showing a majority of one in its favour. A division being demanded, this state of things was exactly reversed, for while 16 members voted for the adoption of the report, 17 voted against it, showing a majority of one against the motion, which was consequently negatived.

The Sanitary Assurance Association.—At the ordinary meeting of the Council of the Sanitary Assurance Association, held at the offices, 5, Argyll-place, Regent-street, Oct. 26th, Professor Hayter Lewis, F.S.A., in the chair, certificates were issued under the corporate seal of the Association to those subscribers who had carried out the recommendations of the Association with regard to the sanitary arrangements of their houses. These certificates are signed by the chief sanitary officer of the Association, Professor Corfield, M.D., and the surveyor, Mr. Mark H. Judge, and they guarantee the satisfactory condition of the houses to which they refer, the inspection, report, and supervision of the work where alterations are necessary being made personally by both officers. The certificates are issued subject to an annual inspection of the property, for which the members are charged a small fee.

THE OPENING *CONVERSAZIONE* OF THE ARCHITECTURAL ASSOCIATION.

THE fortieth session of the Architectural Association was opened on Friday evening, the 28th ult., with the usual *conversazione*, the number of ladies and gentlemen present being, apparently, greater than ever. The large galleries on the ground-floor have become utterly inadequate to the needs of this annual gathering, and but for the courtesy shown by the Council of the Royal Institute of British Architects in placing their rooms at the disposal of the Association, the *conversazione* would have to be held elsewhere. As it was, the whole of the galleries and rooms were somewhat inconveniently crowded, though the Entertainments Sub-Committee this year wisely provided musical entertainment upstairs as well as downstairs. In the large gallery, Messrs. Coote & Tinney's band went through a well-selected programme with much credit, whilst in the Institute meeting-room, after the speech-making was concluded, some part-songs and glees were well rendered by the Artiste' Rifle Volunteers Musical Society, conducted by Lieut. W. H. Thomas. There was a large and varied display of architectural drawings, oil and water-colour paintings, and objects of art manufacture. In the Institute Library, there were displayed a number of delicately-executed pencil sketches of Italian buildings, by Mr. F. Baggallay; a series of charming water-colour drawings by Mr. F. C. Penrose; and some of the excellent photographs (chiefly of old-fashioned inn-yards in Southwark) issued by the Society for Photographing Relics of Old London. In this apartment, too, were on view a number of panels in Japanese lacquer-work, lent by Messrs. Levy Bros.; and a case containing specimens of the manufactures of the Venice and Murano Glass and Mosaic Company. These included reproductions of Roman Murrhine and vitreous pastes, imitating agates, jacinth, sapphires, &c., and a specimen of modern Muranese "Soffiati," after an example in the Municipal Museum at Murano. The walls of the Institute meeting-room were covered with the drawings and sketches made by the Architectural Association's first Travelling Student (Mr. H. H. Kemp), and the drawings which had obtained the other prizes offered by or through the Association. Mr. Kemp's drawings and sketches well merited the encomium bestowed upon them by the President, and, indeed, the draughtsmanship exhibited in all, or nearly all, the sheets displayed on the walls of this room was, as Professor Kerr remarked, of a high order of excellence. In the large gallery downstairs a series of cartoons for wall decorations, designed by Mr. H. Walter Lonsdale for Messrs. W. B. Simpson & Sons, was exhibited, as well as a number of oil and water-colour paintings. Foremost amongst the water-colours, both in number and excellence, were those by Messrs. R. Phené Spiers and Aston Webb. The architectural drawings shown in this gallery included two frames containing measured drawings, by Mr. Sydney Vacher, of Lusignan Cathedral, Famagosta, in the island of Cyprus. Mr. Vacher also lent some specimens of Persian armour. Messrs. Doulton & Co. lent a fine collection of Lambeth art pottery, and close by were a couple of medallions in mosaic work, lent by Mr. F. Garrard, of Millwall. Messrs. Shuffrey & Co. exhibited a stove and mantel, and a well-designed wall-paper; and the Gateshead Stained Glass Company showed some ornamental glass vessels. Messrs. Liberty & Co. exhibited, among other things, some India matting and an Indian embroidered coverlet. Messrs. Gillow & Co. sent some good cabinets, and a panel of gold tissue (modern French) embroidered with a subject after Jean Goujon. The Art Furnishers' Alliance made a large display of cabinets and other articles, some of them designed by Dr. Dresser. Messrs. Gregory & Co. exhibited cabinet-work and some Turcoman curtains. In the smaller gallery were some cartoons for stained glass by Mr. H. W. Lonsdale, the subjects being selected from "As you like it" and "The Merry Wives of Windsor." Here were also shown a number of sketches (by Mr. W. H. Lynn, R.H.A., and several other gentlemen), of buildings seen during the Association's excursion to Worcester in August last, besides an excellent series of photographs of the same buildings taken by Mr. J. H. Robinson, architect, Dublin. Mr. J. D. Crace lent two or three water-colour drawings, including a study of the beautiful ceiling decoration of the Scuola di San Rocco, Venice. Miss C. H. Spiers and Miss Welby contributed some well-executed water-colour sketches of flowers. Messrs. Morant & Co. lent some fine specimens of Venetian and Cordovan wall-leathers, including one from the Palace of the Popes at Avignon, painted by Joseph Vernet. Messrs. Jeffrey & Co. showed specimens of stamped leather and wall-papers, designed by Mr. Walter Crane, together with some original designs by Mr. Crane and other artists.

About nine o'clock Mr. Aston Webb, the President, took the chair, and proceeded to present the books and other prizes gained by the members of the Association during the past session. To the winner of the Architectural Association *Travelling Studentship* (Mr. H. H. Kemp) he presented the Bronze Medal of the Association and a cheque for 20*l*. The second prize (a bronze medal and two guineas) in this competition was taken by Mr. F. G. Hooper; and the third prize (a bronze medal) to Mr. W. A. Pite. The *Essay Prize* went to Mr. A. T. Ellison. The *Architectural Union Company's Prizes*, for the two best series of measured drawings of existing buildings in England, or of portions of buildings, erected previously to the eighteenth century, were awarded as follows,—First (5*l*.) to Mr. Edward Dawber, for his drawings of Red Mount, King's Lynn; second (2*l*. 10*s*.) to Mr. A. Hemingway, for his drawings of Furness Abbey. The *Class of Design Prizes*, for the two best series of sketches submitted in the class during the session, were awarded: First (3*l*. 3*s*.), to Mr. W. J. H. Leverton; second (2*l*. 2*s*.), to Mr. G. W. Ward. In this competition, the work done by Mr. E. D. Pickford, of Weymouth, received "honourable mention." In the *Class of Construction*, the first prize (3*l*. 3*s*.), for the best series of studies submitted during the session, was taken by Mr. W. A. Powell, and the second prize by Mr. W. J. Lander, Mr. C. Dunch's work being accorded "honourable mention." In the *Elementary Class of Design*, Mr. Lander and Mr. Dunch were bracketed as equal for the first prize. The *Colour Decoration Class* prize (3*l*. 3*s*.) was carried off by Mr. J. H. Ince. The *Association's (Silver) Medal*, offered for the best design for a middle-class school for 250 boys, was not awarded, the judges not considering any of the sets of drawings submitted to be sufficiently up to the standard.

The distribution of prizes being concluded,

The President delivered a brief address, in the course of which,—after thanking the ladies for their presence and encouragement, and the Council of the Royal Institute of British Architects for the use of their rooms,—he shortly reviewed the progress of the Association during the past session, which he was pleased to be able to say had been satisfactory in almost every way. The last session would be especially remembered from the fact that during its progress the first studentship ever attached to it was founded. The intention of founding it was mentioned by his predecessor, Mr. Ernest C. Lee, at the opening *conversazione* last year. The suggestion was Mr. Lee's own, and he set to work with great energy to accomplish this object, and, being heartily supported by the subscriptions of past and present members, in a very short time the sum of nearly 700*l*. was promised, and the success of the fund was assured. Before the session was over, Mr. Lee had the satisfaction of awarding the first Architectural Association Travelling Studentship to Mr. H. H. Kemp, upon the result of whose trip, as displayed in the sketches exhibited on the walls, Mr. Lee, the subscribers, and the Association were to be congratulated, and especially so because Mr. Kemp's sketches had set before future holders of the Studentship a very high standard of excellence. The classes of the Association had been well attended during the past session, and their prizes well competed for, though the open prizes had been poorly contested,—an experience shared by other societies. Mr. Webb went on to say:—The briefest notice of last session could not omit the mention of one who very suddenly passed away during its course, and who was a great friend to our work,—the late Mr. William Burges. We were all looking forward to a paper which he had promised on Queen Anne architecture, when he died in the midst of his work,—but recently elected to the Royal Academy, and leaving to young men, above all things, an example of strict integrity and a high standard of honour in his profession, doing all the work he undertook with great thoroughness, and with his whole might. But a new session is now upon us, and we have had to look forward and consider how, with our increasing numbers, we can best increase the usefulness of this Association and meet the enlarged demands which are year by year made upon it. Mr. J. D. Mathews, our treasurer, has suggested a series of lectures which should, in conjunction with our classes, be so arranged as to afford assistance to such of our members as may intend to present themselves for the compulsory Examination about to come into force under the auspices of the Royal Institute of British Architects. This suggestion, I am glad to say, received the support of, amongst others, Professor Roger Smith, and the desirability of these compulsory examinations having been decided on by our representative professional body, we have determined to do as much as is in our power to conduce to their success, though, as a matter of detail, I venture to think that the postponement of the first examination from next Spring to next Autumn would be advantageous. We are well aware that these lectures are a departure, and a very important departure, from the system of mutual help and instruction on which the Association has hitherto been worked, but we, like all other foundations, must, if we are to continue our usefulness, conform to the altered conditions and requirements of the times. The Committee think they may be congratulated on securing the services, as lecturers, of two men so able and so well known in the Association as Mr. Blashill and Mr. Tarver. But when all this has been done, the student must not think that the Association can provide him with all the education, in conjunction with his office work, that he will require. This is not so. He will have still to avail himself, in addition, of some of the many other opportunities and instruction that are now open to architectural students in London, viz., the Architectural School at the Royal Academy, with Mr. R. Phené Spiers as master, and the very valuable Academy lectures; the lectures at University and King's Colleges; the South Kensington Museum Reading-room; the Architectural Museum; the Institute Library, &c. All these are open to the student, who was probably never so well supplied with means of improvement as at present. Still, there is a lack of completeness and cohesion amongst these means of education which I think somewhat detracts from their general usefulness, and a strong head is wanted to gather up the threads and work them into a comprehensive scheme whereby our present somewhat driftless education may be more systematised and the various opportunities open to the student be made, as a whole, more accessible to him. The Architectural Museum, for instance, containing, as it does, an invaluable collection of casts, languishes sadly in Tufton-street, whereas in a position more accessible to us here, its usefulness might be largely increased, to the mutual advantage of the Museum and ourselves. Some day, perhaps, we may see a united attempt made towards the foundation of an architectural college, where our societies may be properly housed, and where our students, assisted by our own professors, could pass through a course of systematic study, say for two years, proceeding then to an architect's office, and finishing up with a one or two years' trip on the Continent previously to entering on the real business of life. But these are only dreams, I am afraid, and a long way at present from fulfilment. Turning to matters of more general architectural interest, we naturally, at the commencement of a new architectural year, ask ourselves what we are now aiming at and working for: what development we have made, and how far we have advanced towards the attainment of a style distinctive of our own day. A new style seems like the philosopher's stone,—hard to find, and it is doubtful if ever it can be found, while some go so far as to think that if we found it we should not like it. The leading academical styles, as I may call them, are largely discarded for the moment in favour of a style with principles not yet formulated and capabilities not fully tested, and therefore not easily learned or taught; and the want of a certain directness of aim under these circumstances is, and indeed must be, noticeable, together with a certain lack of enthusiasm compared with even ten years ago; and it is to be hoped that the increasing attention that has most properly been paid to sanitary matters is not to be given at the expense of the architect's first work, design. For the last fifty or sixty years English architecture seems to have been going through

a course of archæological studies, taken, curiously enough, in something like their original natural progression, but with that progression accelerated a hundred-fold. Some, perhaps, amongst my professional hearers, may remember when the influence of Stuart & Revett was still felt, and Grecian was thought to be the only true architecture. They may remember how since their youth they have been hurried on from Greek to Roman or a freer Classic style, through all the turmoil of the various stages of the great Gothic revival; then introduced to a glimpse of the dainty conceits of "Queen Anne," and even "Georgian"; and finally have found themselves somewhat bewildered and out of breath as they wonder whether, having been brought up to this point, they are going to be carried on still further and brought face-to-face with a real Victorian style, or whether, having come to the brink, as it were, they shall turn back and begin the long round again. This is a question which the young architects of the day (many of whom are members of this Association) will have to answer, and on their diligence, enthusiasm, and imagination the answer must depend. We appear now to have revived all the styles without succeeding in doing more than to revive them. We have hardly revivified them or advanced them much beyond the point at which they were left by their originators. Indeed, we may almost say that the Italians are the only people who have ever succeeded in doing this; but art in those days was part of the life of the people. There was a living interest in it among all classes, and all were able more or less to appreciate and criticise it. A great artist (architect, painter, or sculptor) was held to have conferred, by his works, as much honour and benefit on his country as the bravest soldier or the most successful statesman. From the way, therefore, in which these various styles have been revived and in turn discarded, we seem drawn to the conclusion that they were each brought to the highest perfection possible before they were abandoned by the old men themselves. Now we have reached a further stage, when all the various epochs of architectural design have been in turn tried, and in some sense found wanting; and now, if ever, a departure must be made. But should this departure be made, it will depend for its life as much on the intelligent interest and support of the general public as on all the energy of our own profession, though the two must go hand in hand to ensure success. In all arts subsidiary to architecture, there has long been an increasing general interest, and architects justly claim a share in the initiation of this. Since, and commencing with, the Gothic revival, great attention has been paid to furniture, decoration, needlework, and even ladies' dresses,—all of which have from time to time been designed by architects. So great an improvement has been made in the manufacture of these, that architects are now enabled to give less time to them and more to architecture proper,—the real building in brick and stone. We have now certain well-known æsthetic villages not far from town, where people live in "cots," and fill their gardens with sunflowers,—where ladies dress to suit the houses, and where anything but red brick and white-barred windows are absolutely tabooed. We cannot all live in "cots," even if we wished to, or be surrounded with the quaintness these villages furnish; but the improved taste of the public might assist us to check the miles of dreary stuccoed sepulchres, as they may almost be called, with which the suburbs of London and other large towns are increasingly burdened. Year by year an overwhelming stretch of Portland cement stucco is laid upon us, thicker and thicker. Millions of good money have been spent on these houses, and miles and miles of them have been built, and we cannot remove them, though they fortunately show, in most cases, a great desire speedily to dissolve themselves. But surely it is the fault of the public if this class of building is allowed to still further increase. Let but the speculating builder be given to understand that it is to his interest to supply something of a better character, and he will speedily take means to do so. The æsthetic villages I have referred to at least show that houses may be built of honest materials, be let at moderate rentals, and yet pay; and that palatial monstrosities, badly built, badly drained, and badly planned, are not a necessary evil of the nineteenth century. Great efforts have been made of recent years to improve the dwellings of the labouring classes, and much has been done, but they hardly require it more than the dwellings of the middle classes in our suburbs. Doctors tell us that porous walls, decaying plaster, and very little drainage, are all prolific sources of disease, and yet this is hardly an exaggerated description of the houses I speak of. It rests with the public, who have so far improved in the internal decoration of their houses, to require that their construction, sanitation, and design should be also improved. Mr. William Morris, in an admirable address which I have seen in the *Builder* of to-day [p. 537, *ante*] puts the matter far better than I can when he says that a reasonable share in the beauty of this earth is the right of every man who will earn it by due labour, and that a decent house with decent surroundings for every family is the claim made in the name of art. Our churches have been nearly all restored. Let us now set to work to restore something like design into our residential streets, and, more fortunate than church-restoration, it will probably be a long time before a society is started to oppose it. An attempt has recently been made to improve the stuccoed fronts of London houses by painting them in colours,—dark red being much favoured,—but, to my mind, this only makes matters worse, and it is to be hoped the fashion will not spread. As to the interiors of such houses, many of the ladies who have favoured us with their presence this evening well know the effort necessary to drape or otherwise hide the irrepressible marble chimney-piece, and in summer time to conceal the register-grate, and the vain effort to subdue the rampant cornice to something like subjection to a prettily-designed paper. While in our everyday life we are surrounded by so much that is bad and utterly commonplace, it seems too much to hope that an occasional grand church, public building, or mansion can affect largely the general taste against so much that is enervating and bad in their everyday surroundings. Architects are powerless in the matter unless backed by general public opinion, because their aid is not sought in the erection of these houses. Painters have set an example of late years of building houses of a design in accordance with the internal decorations, though these are, as a rule, somewhat larger than houses of the class of which I am speaking. Architecture, to be a living art amongst us, when architects can work with the full sympathy of the public and each other, must not, as it seems to me, be kept for display only in our public buildings (though these, of course, will always call forth its highest powers), but must also be found in our houses, so that, by beginning at the lower level, we may work upwards. When a knowledge of and interest in architecture have been more widely extended, we shall soon see the result, not only in our great buildings, but also in our small dwellings, which, it is to be hoped, will some day be "designed in beauty and built in truth."

Professor Roger Smith said it was always a pleasure to attend the opening meeting of the Association, and to see one old friend after another advancing to preside over its year's work after having done much good service for it in previous years. He congratulated the President upon the large number of visitors who had come to support him on that occasion. He trusted that the session upon which the Association was then entering,—and which, in some respects, was a more than ordinarily important one,—might meet with all the success which could be desired. With regard to the Examination which had been established, and the efforts of the members to prepare themselves for it, he should shortly have an opportunity of speaking to them on the whole question, and would only now say that anything which could be done by the Association towards attaining success would have his most cordial goodwill, and, as far as other engagements would allow, such assistance as it might be in his power to give. A member of the Association was now the Professor of Architecture at University College, and on that ground he thought that University College and the Architectural Association classes ought to give one another any assistance that they could. Referring to the presentation of prizes, he said it appeared to him that the work which had been done during the last session in competition for those prizes was very creditable, and that the gentlemen who had obtained the prizes were to be congratulated upon having achieved substantial successes,—successes which were, he hoped, auguries of their obtaining some of the prizes of the profession in after-life. He believed that it was as true with regard to the profession of architecture as it was of that portion of animated nature which Mr. Darwin had studied, that in the struggle for existence only the fittest would survive. It struck him that those who had begun professional life by obtaining these prizes would be the most likely to be successful in after-life. The very effort to secure the prizes offered by the Association and in other quarters would be of lasting benefit to all who had striven earnestly for them, even though they were not actually fortunate in carrying them off. For the time being, the pursuit after the honour of obtaining the prizes offered by schools and academies was keen, and the competitors looked very little beyond it, but the real object of such contests lay behind. It was not for the sake of adding "M.A." or "B.A." to his name that a student toiled for years, but for the sake of obtaining that cultivation of which those letters appended to his name were the index. It needed only a glance to show that the young men who were doing architectural work in the classes of the Association in competition for the prizes offered were fitting themselves for doing excellent architectural work in after life.

Mr. T. Chatfeild Clarke observed that he had listened with great pleasure to the President's address. He was glad to hear the touching reference made in it to the death of Mr. Burges. The young architects of the present day were to be congratulated on the greatly superior opportunities they had of learning their profession as compared with those available when the senior members of the profession were young. He trusted that the opportunities and advantages which young architects now had would be made available by them to the fullest possible extent. He thanked the President for his appropriate reference to the extreme æstheticism of the day, and which was so justly ridiculed in such plays as "The Colonel." With regard to the question of a new style, it did sometimes strike him as singularly surprising that in the present age,—so fruitful in great design, and characterised by so much scientific knowledge,—learned as were our architects as a body, the discovery of any fresh spring of design or of a new style seemed to be impossible. However much that was to be regretted, it was matter for congratulation that the study and practice of the various styles of design that were known had been pursued so thoroughly in the present day by such men as the late Sir Gilbert Scott and the late Mr. E. M. Barry, and others who might be accounted the most polished and accomplished architects of the present age. He was very glad indeed to see that Canon Barry was going to produce a memoir of his brother, because he felt that Mr. E. M. Barry possessed in an eminent degree the qualities of an "all-round" and cultivated architect,—great power of planning, great facility of design, and great knowledge of style,—and for those qualities he ought to be honourably remembered among architects.

Professor Kerr congratulated Mr. Webb upon having attained to the honour,—the very great honour,—of presiding over a society which occupied so important a position in the profession. The Architectural Association was a society absolutely unique in the world. In no other profession, so far as he was aware, would it be possible for the students,—actually the students,—to combine together and form an organisation which should exercise so much influence as the Architectural Association on the profession to which they belonged. The Association had conducted, for the last thirty-five years, an elaborate organisation of self-instruction, properly so-called, with the greatest possible success. The work which the Association was doing, so far as it appealed to the eye, was seen upon the walls of the room. The draughtsmanship which was there exhibited would be adjudged, by all competent observers, draughtsmanship of the highest quality. The architects of the younger generation had this claim to make before the English world of the present day,—that draughtmanship had flourished amongst them to a degree that was perfectly amazing. In his estimation the architectural profession had made far more progress in draughtsmanship during the last quarter of a century than painters and sculptors. The masterly skill in drawing which was displayed by so many young men in the architectural profession at the present time seemed almost incredible. So great was their skill that they were on the verge of a particular danger arising out of it, viz., the practice of design

upon the basis of mere draughtsmanship alone, without reference to that philosophical basis of construction which, more than anything else, was at the root of architectural art. But the excellent organisation of the Association was, happily, brought to bear upon facilitating the study of other subjects than the admirable but comparatively superficial one of drawing. The substantialities of building and the administration of an architect's office business were subjects for the study of which the Association afforded means to its members. Altogether, a more useful society than the Architectural Association could not exist in any profession, and he was delighted to see so many young men coming forward and joining the Association with the view of making themselves worthy members of a cultivated and gentlemanly, and, what was no small matter in these days, a thoroughly honest profession.

With this the formal part of the proceedings of the evening terminated.

NO MORE RAILWAY TUNNELS.

It is a remarkable coincidence that at the very moment that a project is taking shape for the construction of a tunnel under circumstances of greater risk and probable cost than any which has yet been attempted, trains should be for the first time started by a method which, if it fulfils the sanguine hopes of the inventor, will remove the chief reason for the construction of tunnels through mountain chains.

The railway system, it is well known, is a growth rather than a creation. The speed now common was never anticipated by the fathers of the system. The discovery of the power of the blast, to which that speed is mainly due, was accidental. It was partly due to the nature of the country between London and Birmingham, and partly to the entire novelty of the great experiment then about to be made, that Mr. Robert Stephenson fixed on the inclination of one in 330 as the ruling gradient of our first trunk line, on the principle that the resistance due to gravity should not exceed the resistance due to friction.

The great saving in the friction resistance effected by the use of the iron rail led engineers, somewhat later, to allow very much wider margin as to the resistance of gravity, or, in other words, as to running up hill. Mr. Brunel was the first to adopt concentrated inclines, treating the locomotive after the fashion of a live horse, that can run up a hill at a spurt. But the limits of nature are inexorable, and while an incline of one in fifty is an outside allowance for railways over very difficult country, a rise of one in twenty is the limit of ordinary engine-power, as all that a locomotive can do is to ascend such a gradient without any load.

Different appliances have been tried, in different places, for surmounting steeper inclines. The temporary Fell Railway ascended the Mont Cenis pass at the incline of one in twelve. But a sharp economical limit is fixed by the rapid increase of the dead, as compared to the live, weight. An engine that could just crawl up an incline of one in twenty could draw a train of 150 tons at twenty-five miles an hour on the level.

Here, in fact, is the weak point of the locomotive engine. It has many great advantages. But it is a costly mode of applying power at the best, producing, all things being taken into account, only about one-fifth of the effect due to the mechanical agency exerted. And this cost increases so enormously with the increase of gradient, that it has been found necessary to spend from 100,000*l.* to 330,000*l.* per mile in making tunnels in order to maintain practicable gradients.

On an incline of one in 100, in addition to the loss of power arising from the use of a locomotive engine on the level, there is an additional resistance equal to more than three times that of the train on the level. On an incline of one in fifty, the resistance is between six and seven times as much. The comparative cost of the locomotive method of traction increases at this rate.

The weight of the locomotives on our English lines may be taken at from thirty to forty per cent. of that of the trains which they draw. If we could substitute fixed power for locomotive power (without inducing extra sources of cost), we should then reduce the work that we have to do by from thirty to forty per cent., and also perform the remaining work at a less cost. Thus the same expenditure of power that would take a locomotive and train up an incline of one in 330 would take a train alone up one in 100. And the same expenditure of power that would take a locomotive and train up an incline of one in 100 would take a train alone up an incline of one in fifty.

Now, if by the use of the electric railway we can substitute a light dynamo-motor machine for the great weight of the locomotive engine, an increase, to that extent, of our power of surmounting inclines will be at once given. It is, therefore, with the utmost interest that the architect, as well as the engineer, will watch the development of the application of electricity to railways. While one great effect of steam has been to concentrate mankind in dense urban masses, it is, perhaps, not too much to hope that it may be a result of the application of electricity to redistribute population more widely over the surface of the country.

PAYMENTS IN CASH, NOTES, AND CHEQUES.

A subject of much interest to all persons engaged in the building trade was illustrated by a paper read by Mr. G. H. Pownal, at the Institute of Bankers on the 19th ult., "On the proportionate Use of Credit Documents and Metallic Money in English Banks." While bankers are those whom it is natural primarily to address on the subject, it has even a more lively interest to those to whom Saturday brings an amount of labour and anxiety in the payment of metallic wages which it is necessary to undergo in order to appreciate. The arrangements under which the exchange of the note of time for silver and copper takes place are perhaps susceptible of improvement, to the advantage both of paymasters and of workmen.

The returns of the past fourteen years show an increase in the amounts passing through the London Clearing-house, from 3,257 millions in 1867-8, to 6,013 millions in 1874-5. In 1877-8 they were 6,088 millions; they fell in 1878-9 to 4,885 millions; rose in the year of the election to 5,265 millions, and fell again to 5,009 millions. Mr. Pownal estimated the aggregate bill and cheque transactions of the English banks for the year at the sum of 11,135 millions sterling. It has been calculated that 97 per cent. of the transactions of the wholesale commerce of the United Kingdom passes through the hands of the bankers; but the opinion was expressed at the meeting, and adopted by the chairman, Sir John Lubbock, that the banking transactions do not by any means represent the amount of business done in the country.

As connected with the payment of wages, it is to be observed that more metallic money is paid into the county banks than bank-notes. This is due to the fact that the smallest note, 5*l.*, is generally useless for the payment of wages. The subject of 1*l.* notes was mentioned with reference to this, but not discussed. The experience of Ireland, where 1*l.* notes were certainly of great convenience during the construction of railways, ought to be conclusive on this head. The proportional payments by cheque, notes, and coin in the present year are shown as follow:—

	London.	Dublin.	Edinburgh.	New York.
Coin	0·728	1·57	0·55	0·28
Notes	3·039	8·53	12·67	1·02
Cheques and bills	97·233	89·9	86·78	98·7

Society of Arts.—The first meeting of the new session will be held on Wednesday, November 16th, when the opening address will be delivered by Sir Frederick J. Bramwell, F.R.S., chairman of the Council. The following are among the papers which will be read during the session:—"The American System of Heating Towns by Steam," by Captain Douglas Galton, C.B., F.R.S.; "Stained-glass Windows," by Lewis Foreman Day; "Photometric Standards," by Harold Dixon; "Telephonic Communication," by Lieut.-Col. C. E. Webber; "The Causes and Remedies of Bad Trade," by Walter R. Browne, M.A.; "The Production and Use of Gas for Purposes of Heating and Motive Power," by J. Emmerson Dowson; "Gas for Lighthouses," by John Wigham; "The Relation of Botanical Science to Ornamental Art," by F. Edward Hulme, F.L.S., F.S.A.

THE NEW YORK METROPOLITAN MUSEUM.

The last report of the New York Metropolitan Museum has recently been distributed on this side of the Atlantic, and offers several features of interest. The Museum was founded some years since, as will be remembered by many of our readers, "with a view to giving to the American metropolis and the country at large an institution the aim of which was to excite a powerful influence for good on the intellectual character of the commercial and industrial prosperity of the people." When last we had occasion in these columns to refer to the New York Metropolitan Museum, the collections composing it were still in their old home in Fourteenth-street, where they remained very much crowded from want of room. The new report shows us the Museum moved up town to the grand new building in Central Park, where, however, we learn, the accommodation is still far from sufficient to lodge the continually increasing collection of works of art.

While the report in many respects has a tone of congratulation at the results so far obtained, an earnest appeal is made to the public for support. Desirous to remain as far as possible free from Governmental aid, the Museum looks to its subscribers and donors to extend the benefits, not alone effected by the influence of the works of art exhibited, but by the system of artistic and technical education that has been established in connexion with the Museum. The city of New York has already generously presented the building in Central Park, while the Department of Parks has laid an annual grant at the disposition of the Museum authorities; but the expenses of the move from the old quarters down town have been heavy, and we are assured that it is alone by the strictest economy that both ends have been made to meet. To secure the maintenance and future of the Museum, its governing body, in the first place, urge that recognition of its educational importance which, as they remark, is fully accorded in Europe to such kindred institutions; in the second place, as being unwilling, from political difference from the constitutions of the nations of the old world, to claim a Government grant, and consequent State interference, the authorities urge the necessity of a permanent endowment ample for the support of the Museum, and under the constant supervision of those who may have provided the funds. From the public thus so directly appealed to, the Museum certainly has a right to expect a favourable reply, the report showing that between April 1st, 1880, and the 30th of April last, a total of over 1,200,000 persons visited the Museum.

The working of the Museum is not, however, as we have above remarked, confined to the gathering and exhibiting of works of art belonging to the great European industries of the past. It may be mentioned by the way, as a deficiency which it is to be hoped will in time be supplied, that the interesting and beautiful art of North America is represented in no adequate manner in the New York Museum. A very comprehensive system of technical instruction is supplied by the Museum; indeed, it is on the extension and strengthening of this that the authorities lay the greatest stress, and the passage in the report which refers more particularly to this portion of the labours of the institution merits attention at a moment when not only is the subject of technical education attracting earnest attention on both sides of the Atlantic, but when in the international competition in the struggle for superiority, it is the nation which is the best prepared which will infallibly gain the day, the smallest advantage of one over another will give in the wavering contest the victory. In this battle, for such it has become, it is to the technical instruction we afford our artisans that we, as Englishmen, must look, more even than to the reputation we have so long borne in the world; the countries which we generally understand as "foreign" have been pressing close upon us for years, and America, with its ardent activity, now promises to become a rival. In the report of the New York Metropolitan Museum now before us, an acknowledgment is made of the superiority of our system of technical art instruction, and this, coming from such a quarter, we may feel as purely unprejudiced, an absence of prejudice in the consideration of all matters having been ever a ruling principle of American

progress; but the superiority we are supposed to enjoy, we may rest assured, will not be long retained, unless with equal earnestness our authorities honestly endeavour to inquire into and improve each department which may be under their supervision. Technical schools, remarks the report at present under consideration, for the teaching of artisans, are essential to the progress of American industrial art. The time has certainly arrived when America should cease to be dependent upon foreign production of beautiful work in any and every department of industry, when American youths should have the facilities for learning how to produce beauty which German, French, and especially English youths have in technical schools. It may be affirmed that in every kind of mechanical work, however inferior its character among the arts, the mechanic who can design as well as do his work is worth more to himself and to his employers than one who can only follow a director or do that which he has seen done. If American industrial art is to rank with that of European countries it can only be by having educated artisans. There are thousands of young persons in this city whose talent needs only to be discovered and developed for the supply of the highest class of artisanship in every department of beautiful productions. That this talent exists in abundance is already manifest in our schools.

The technical instruction so far afforded in New York would appear at present to be but in an incipient condition, but the subjects chosen for the various courses point to what future energy may lead, from the 143 pupils who a year ago joined the school then opened in the First Avenue and Sixty-eighth-street; drawing and design, modeling and carving, carriage-drafting, decoration in distemper, and a class of no small practical importance, in plumbing, form the curriculum. With the extension of the Museum buildings every hope is expressed that accommodation will be afforded for these technical classes under the roof of the parent establishment. Small as the beginning may seem, in a land of rapid development such as America, we may with confidence shortly look forward to the results of this first step in a new direction.

An appeal is made by the Museum authorities for the increase of the Art Library as essential not alone to the officials in the compilation of their catalogues and the arrangement of the collections, but for the use of the students and the public generally, who must be supplied with an ample fund of authorities for consultation and instruction.

The report concludes with a lengthy list of donations made to the Museum during the past year, additions to the collection in many instances of the choicest and rarest description.

THE HOLBORN RESTAURANT.

This establishment, which during the last few years has been in the hands of Messrs. Gordon & Co., the enterprising *restaurateurs*, is now, and has been for some time past, in course of rebuilding and enlargement. The work is being carried on without any interruption of the business, which is very extensive. The excellent management of the place has gained for it a reputation of a very different kind from that which attached to it, rightly or wrongly, in the days, or rather nights, when it was known as the Holborn Casino.

In order to extend the Holborn frontage, four houses adjoining the old entrance have been removed, so as to give a total length of frontage of 71 ft. 6 in. Here will be the main *façade*, pleasingly designed in the French Renaissance style by the architects, Messrs. Archer & Green. On the ground story there will be three shops (to be let separately), the central entrance, and, at the west end of the *façade*, the entrance to the *buffet* (now open). The whole of the external masonry of this story will be in Shap granite, the upper portion being in Portland stone, with Shap granite shafts and pilasters. Roughly speaking, the site of the buildings resembles in shape the letter T, with the perpendicular portion thickened, and the bottom of it forming the Holborn *façade*. The left-hand end of the horizontal portion of the letter represents the Little Queen-street *façade*, which will have a frontage of about 43 ft. The site extends southwards from Holborn (or along the upright part of the letter, so to speak) for about 170 ft., the extreme distance from east to west (or along the horizontal member of the letter) being about 150 ft. The *buffet* (the entrance-lobby to which has been decorated with tiles, &c., by Messrs. W. B. Simpson & Sons, of St. Martin's-lane) runs back from Holborn for a distance of 98 ft., and has an average width of 16 ft. This apartment is broken up into five square bays or compartments, and the four coves of the panelled ceiling or roof of each compartment (two or three of them come under the upper floors of the front building, the others being top-lighted by means of stained glass lights) are painted on a gold ground with incidents of the chase, vintage, and other subjects appropriate to the place. These paintings, we understand, are the work of Mr. Durham, of the Slade Life School, University College. The whole of the wall surfaces in this apartment are of costly and tastefully-selected marbles, with detached shafts and other architectural members in relief. The effect is rich but subdued, for though mirrors are largely used there is an absence of anything like garishness. The woodwork is of American walnut, with ebonised mahogany frames to the mirrors. The floor, like those in the grill-room and other parts of the new building, is in quiet-toned marble mosaic, and is the work of Messrs. Burke & Co., of Newman-street, whose name is a guarantee for excellence in this department. This firm has also executed the whole of the marble-work in the *buffet*, grill-room, and in other parts of the building. At the south end of the *buffet*, swing doors give access to a lobby from which, on the right, the gentlemen's lavatory is entered (under a solid marble staircase leading up to the smoking-room), and from which, opposite the *buffet*, the grill-room is entered. The grill-room is a fine apartment 36 ft. by 34 ft. by about 13 ft. 6 in. high, and occupies the site of the former grill-room. On the south side is a range of windows, including a large bay filled with stained glass by Mr. Alexander Gibbs, of Bloomsbury-street. These windows, and others in the building, are very good of their kind, but must be regarded rather as pictures on glass than as stained-glass windows. The walls of this apartment are entirely lined with marble and mirrors, the ceiling being panelled in walnut and "muralis" by Messrs. Campbell, Smith, & Co. A notable feature in this room will be the grill, or rather the structure enclosing the grill. This, which is not yet finished, is in Lambeth glazed majolica ware, supplied by Messrs. Doulton & Co., and will be very effective in appearance and cleanly in use. The gentlemen's lavatory, which is about 25 ft. by 17 ft., and the same height as the grill-room, is handsomely and admirably fitted up. Here, *carte blanche* was given to Mr. George Jennings, of Stangate, by whom all the work (including, besides the various fittings, the wall-tiling, the pavement, and the ceiling) has been done, with the same attention to detail and excellence of workmanship and material which characterise the other apartments in the building. Everybody knows what Mr. Jennings can do, and here he has surpassed himself. The ceiling is of enamelled slate, and the walls are covered with ornamental glazed tiles manufactured by Messrs. Minton. The floor is paved with black and white marble. The woodwork used throughout here is mahogany. The water-closets are of his best and simplest kind, and the lavatories are provided with tip-up basins arranged in sets of three in semicircular slabs of white marble, in order to provide as many basins as possible in a given length, and at the same time to afford the persons using them sufficient "elbow-room." The urinals are of the lipped pattern, fixed against slabs of black marble, the compartment divisions being of white marble. The flushing of these fittings is effected every ten minutes by Mr. Jennings's automatic syphon-flushing tanks. On the pavement level, immediately under the lip of each convenience, is a circular disc of black marble, about 12 in. in diameter, a large part of the central portion of which is perforated in quatrefoil form. The use of this perforation will be obvious. Beneath this perforated disc of black marble is a white basin with flushing-rim, and this basin is flushed automatically at the same time as the other parts of the apparatus. This arrangement has been devised with the view of preventing the accumulation of foul-odoured deposit only too common where iron grids are used in similar situations, and it appears to be entirely successful, for although this apartment has been in use by some hundreds of persons daily for the last nine or ten months, no offensive odour is perceptible. The smoking-room, or south-west room on the first-floor, occupies the same position as the apartment known in the old building as the Duke's Saloon. It is about 45 ft. long by 27 ft. wide, and is nearly 17 ft. high to the surface of the ceiling, from the centre of which rises a large lantern-light glazed with stained glass. This glass, as well as that in the windows of the room, is by Mr. A. L. Moore, of Southampton-row, Holborn. The walls of the room have a dado and superincumbent panelling in walnut-wood, Jacobean in style, and admirably executed. This and the parquet flooring and other fittings and decorations of the room are the work of Messrs. Maple & Co. Above the panelled woodwork is a frieze in "Muralis,"—a wall decoration of the merits of which we have often spoken. The cornice is of walnut and "muralis," with *carton-pierre* enrichments. The bronze gilt statues of the "Four Quarters of the Globe" are by Messrs. Elkington & Co., who also supplied the lamps in the *buffet*. The ceiling is panelled in walnut and embossed "muralis." The gas-fittings here and in some other parts of the new building have been made (from special designs) by Messrs. Hulett & Co., of High Holborn. The panels along the north side of the room are filled in with paintings on canvas (having the appearance, until closely examined, of tapestry) by M. Du Mont, the subjects being taken from incidents in the careers of Queen Elizabeth, Mary Queen of Scots, and Lady Jane Grey. On the east side of the room are three openings looking on the balcony of the grand saloon. These openings, of which the central one is the largest, are intended principally to allow the music from the orchestra in the Grand Saloon to be heard by the occupants of the room, and are filled with exceedingly well-designed and executed wrought-iron grilles, by Messrs. Barnard, Bishop, & Barnard, the appearance of which, however, is not improved by the gilding with which they are entirely covered. The so-called "Tobin" tubes are used here for the admission of fresh air, arrangements being made for the extraction of the vitiated air of the apartment by the lantern-light already mentioned. The external glazing of this and other top-lights in the building is done on Rendle's patent system. We may add that the floors throughout are to be constructed on Messrs. Dennett's fireproof method.

With the exception of a small private dining-room adjoining the smoking-room, the only other portions of the new building completed are some of the offices in the basement, such as the butchery, the vegetable kitchen, &c. The principal kitchen is not yet completed. When it is, it will, of course, be fitted with every possible convenience and appliance to facilitate the work of the busy *chef* and his army of assistants. Messrs. Benham & Sons, of Wigmore-street, will supply and fit the necessary apparatus. The walls of all the kitchens, scullories, larders, &c., are lined with white glazed bricks.

Before concluding, we must say a few words as to the remaining and larger portion of the work not yet carried out, although it is progressing in sections. The general arrangement of the central portion of the building will adhere very closely to the existing plan. Thus the Grand Saloon will be retained in its present position, and its dimensions, when rebuilt, will be about 88 ft. 6 in. long by 49 ft. 9 in. wide, the roof being carried somewhat higher than the roof of the existing saloon. The balcony, 8 ft. wide, and the orchestra, are features which will be repeated in the new building. Access to the new Grand Saloon from the Little Queen-street entrance will be by a corridor very similar on plan to that at present existing; but from the principal entrance in Holborn, direct access will be had to the saloon through a lobby or crush-room, 27 ft. by 24 ft. This crush-room, which will contain the grand staircase, will necessarily be one of the features of the building, but it is not yet commenced. On the first-floor of the front building, and extending the whole length of the Holborn frontage, will be a banqueting-hall, 68 ft. long, 36 ft. wide, and 21 ft. high; together with smaller dining-rooms for private parties, cloak-rooms, ladies' rooms, dispense kitchen, &c.

The work is being carried out from the architects' designs, by the proprietors, Messrs. Gordon & Co., without the employment of a general contractor, the practical supervision of the whole being in the hands of Mr. G. H. Holloway, clerk of works, and Messrs. W. Spencer and T. Holloway, foremen of works. The total cost of

the buildings, which will probably be completed during the next two years, will approach 70,000*l.*

We may add that many little contrivances and details of arrangement in the work already carried out are the embodiments of suggestions made by Mr. Hamp, the energetic manager.

What we have said with regard to this building would suffice to show the enterprise of Messrs. Gordon & Co. But they are known also as the proprietors of the Grand Hotel, Charing Cross (a venture which has proved so successful that it is now being, as we stated in detail some time ago, considerably enlarged), and of Crosby Hall, and are the projectors and proprietors of the First Avenue Hotel, which will have a frontage on the northern side of Holborn extending from Brownlow-street to Warwick-court, with return frontages to both those thoroughfares. The site of this newest of monster hotels is now being cleared, and as soon as this work has been effected, building operations will be commenced. The building (which will, we understand, be erected by Messrs. Gordon & Co., themselves, under the supervision of Messrs. F. & H. Francis, in conjunction with Messrs. Archer & Green, as architects) will not be so sumptuously fitted and furnished as is the Grand Hotel, as it is intended more especially for the use of mercantile and legal gentlemen. Its situation, midway between the City and the West End, and close to the Inns of Court and New Courts of Justice, would seem to be well chosen to meet the wants of commercial men and lawyers. The estimated cost of this building is 100,000*l.*

THE NEW LEIPSIC CONCERT HALL.

The concerts which, for a hundred years past, have been given in the old *Gewandhaus* at Leipsic, have attained a world-wide celebrity. That hall has, however, ceased to satisfy the musical requirements of the present day, and it has accordingly been determined to erect a special *Concerthaus* for the great Leipsic performances of the future. The architects of this elegant and spacious edifice, the erection of which is now on the point of being commenced, are Herren Gropius & Schmieder, of Berlin, whose design was selected from among those of five competitors. The site will be near the Botanical Gardens, and has been presented to the city for the purpose by the owner, Herr Voigt. The estimated cost of the structure is 49,500*l.*, of which 20,000*l.* are derived from a legacy left by Herr Grassi. The exterior of the edifice, judging from the original drawings, will be exceedingly tasteful and imposing. It is in the favourite Romanesque style. In the interior we find three principal divisions, one being the great hall for the well-known grand concerts, a smaller hall for chamber music, and the *foyer*. The grand hall occupies the centre of the building, the smaller hall and the *foyer* being situated each side. The smaller hall will be carried out in exact imitation of the old *Gewandhaus* hall. The dimensions of the great hall may be gathered from the fact that it covers a space equal to that of the Berlin Opera-house, stage and auditorium inclusive. The Leipsic great hall will contain 1,600 seats, with ample room between each row, and wide passages. The orchestra will be arranged so as to be capable of being removed or made of different dimensions. It will be surmounted by a large organ, placed in a gilded recess.

SPOHR'S MONUMENT AT CASSEL.

The bronze monument in honour of the great musician, Spohr, has recently been completed by Herr Hartzer, a sculptor of Berlin. It will be shortly erected in the city of Cassel, on the Theaterplatz. The monument represents Spohr with his favourite instrument, the violin, in the left hand, while the right hand is raised as in directing a band. The general effect is very good.

Cantor Lectures.—The following are the subjects of the courses of the Society of Arts Cantor Lectures for the session just about to commence:—First course, on "Some of the Industrial Uses of the Calcium Compounds," by Thomas Bolas, F.C.S. Second course, on "Recent Advances in Photography," by Captain Abney, R.E., F.R.S. Third course, on "Hydraulic Machinery," by Prof. John Perry. Fourth course, on "Book Illustration, Old and New," by J. Comyns Carr.

THE COST OF IGNORANCE.

Few persons have any idea of the immense sums which we of England have to pay for want of scientific knowledge, as well as for want of taste and artistic power. It is a very mortifying reflection, for example, that while the raw materials from which most of the coal-tar colours are made are produced in our country, the finished and valuable colours are nearly all manufactured in Germany. The crude and inexpensive materials are exported by us abroad to be converted into colours having many hundred times the value, and these expensive colours have again to be bought by English dyers and calico-printers for use in our staple industries. This was forcibly pointed out by Dr. Roscoe, in a paper on "Artificial Indigo," read before the Royal Institution last season, and which we have recently met with in print. It may be useful, we think, to repeat the passage. The total annual value of manufactured coal-tar colours, says the writer, amounts to about three and a half millions; and as England herself, though furnishing all the raw material, makes only a small fraction of this quantity, but uses a large fraction, it is clear that she loses the profit on the manufacture. The causes of this fact which we must acknowledge, viz., that Germany has driven England out of the field in this important branch of chemical manufacture, are probably various. In the first place, there is no doubt that much of the German success is due to the long-continued attention which their numerous universities have paid to the cultivation of organic chemistry as a pure science, for this is carried out with a degree of completeness and to an extent to which we in England are as yet strangers. Secondly, much, again, is to be attributed to the far more general recognition amongst German than amongst English men of business of the value, from a merely mercantile point of view, of high scientific training. In proof of this it may be mentioned that each of two of the largest German colour works employs no less a number than from twenty-five to thirty highly-educated scientific chemists, at salaries varying from 250*l.* to 500*l.* to 600*l.* per annum. A third cause, which exerts a great influence in this matter, Dr. Roscoe thinks, is the English law of patents. This, in the special case of colouring matters at least, offers no protection to English patentees against foreign infringement; for when these colours are once on the goods they cannot be identified. It cannot be too often pointed out that the study of the most intricate problems of organic chemistry, and those which appear to many to be furthest removed from any practical application, are in reality capable of yielding results having an absolute value measured by hundreds of thousands of pounds.

GYMNASTIC HALL AT BRÜNN, AUSTRIA.

A new "Turnhalle" (Hall of Gymnastics) has been completed at Brünn. It consists principally of a hall, 102 ft. long, 52 ft. 6 in. wide, 50 ft. high, pointed arches, elaborate woodwork with gallery running all round, richly coloured; another large room, 52 ft. 6 in long, 26 ft. 6 in. wide, 26 ft. 6 in. high, with wooden ceiling and rich intarsia decorations, panelling, &c. The building is Gothic in style, and outside is of brick, and very effectively constructed. Herr August Prokop is the architect.

WORKMEN'S DWELLINGS, PLYMOUTH.

The foundation-stone has just been laid of four blocks of dwellings which are now being erected by the Plymouth Workmen's Dwellings Company (Limited) on an exceptionally open site at the manufacturing end of the town. The buildings, which are to be four stories high, and on a somewhat new principle, will contain accommodation for ninety-six families in 256 rooms, exclusive of wash-houses (with drying areas attached), pantries, coal-bunks, and cupboards, w.c.s, and urinals. Each landing will contain provision also for drawing water, and for the removal of dust (in shoots) and dirty water. Each dwelling will be entirely separate. The w.c.s will be separate for the sexes. The buildings will be constructed in a substantial manner, and the sanitary arrangements, we are told, will be efficient.

The contractor is Mr. Philip Blowey, of Buckland Monachorum, and the architects are Messrs. Hine & Odgers, of Plymouth.

It is anticipated that the new dwellings will be quite as successful financially as those recently erected in Lower-street, from the designs of the same architects, and which pay a clear 5 per cent. after making due allowance for voids, &c.; the rent charged for each dwelling (including use of wash-house and all domestic conveniences) being 2*s.* 2*d.* per week, except where two bedrooms are attached, instead of one, in which case the rental is 3*s.* 3*d.* per week.

VALUE OF BUILDING LAND AT THAMES DITTON.

Last week a building estate at Thames Ditton was sold in 106 lots, at the Swan Hotel, Thames Ditton, by Mr. Richard J. Collier. The property consisted of freehold building land, having frontages to the river Thames and the high road, from Thames Ditton to Hampton Court, and known as Sumner-road. The estate is situated within a short distance of the Thames Ditton Station, on the South-Western Railway, in a favourite boating and yachting locality, offering eligible sites for the erection of river-side residences. Three new roads, each 36 ft. in width, and named respectively Alexandra-road, Queen's-road, and Oakfield-avenue, have been laid out on the estate. There was a numerous attendance at the sale, and all the lots were sold, with a spirited competition, more especially for the several lots facing Oakfield-avenue, and extending in depth to the Thames. These lots, which have frontages of 20 ft. each, with a depth ranging from 180 ft. to 216 ft., realised from 80*l.* to 90*l.* each, a tavern plot, with a frontage of 40 ft., being sold for 156*l.* The total proceeds of the sale amounted to 3,480*l.*

SOUTH LAMBETH DWELLINGS.

The South Lambeth Dwellings, which have been recently built for the South London Dwellings Company, Limited, from designs by Mr. E. Hoole, of 30, Russell-square, occupy the site of Surrey Lodge, for many years the official residence of the Clerk of the Peace, situated at the intersection of the Kennington and the Lambeth roads.

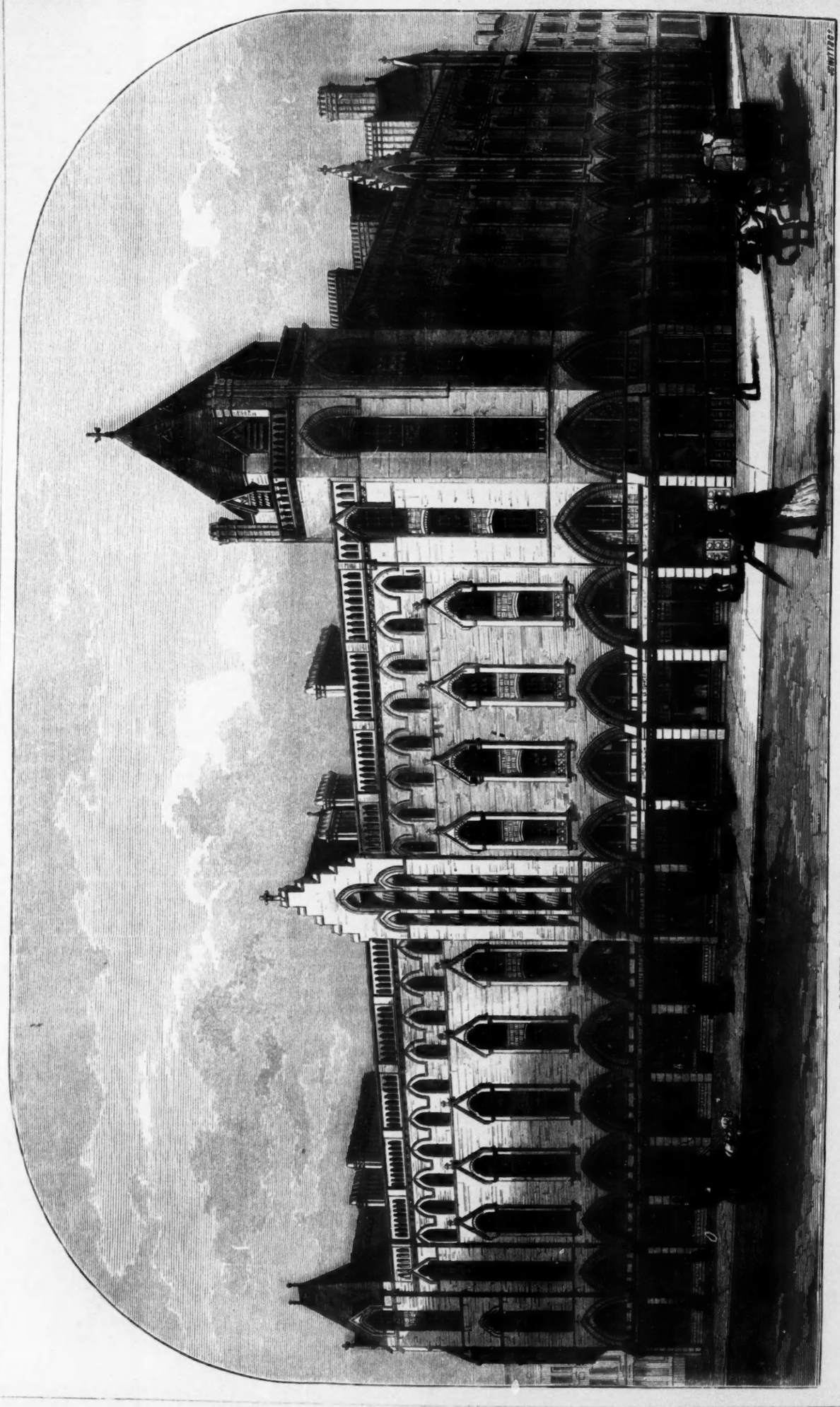
They form a quadrangle, two sides of which consist of blocks of tenements, while the other two are formed of separate cottages. In the centre is a recreation-ground, planted with shrubs and trees, and provided with gymnastic appliances. All the dwellings are prepared for the artisan class, though one of the cottages is occupied by a lady who collects the rents and exercises a general supervision. The blocks, of which we give plans, with the exception of the ground-floor are divided into separate tenements, entered from a balcony on each floor, and contain suites of four, three, and two rooms, while a number of single rooms are also provided. The octagonal tower at the angle is distinct, being separated by party-walls from the Kennington and Lambeth blocks of building. On the ground-floor of this tower is a coffee tavern, with kitchen, stores, &c., in the basement. On the first floor is a club-room; the three floors above are divided into small bedrooms, and are surmounted by the laundry under the conical roof of the tower. Shops, with living and bed rooms attached, and basements below, form the lower part of the blocks of dwellings.

A large portion of the roof is flat, and serves as drying-ground, being level with the laundries, of which the second occupies a tower at the end of the Lambeth block. The laundries are fitted with coppers, &c., assigned to the various tenants. Water is laid on to each floor, and every tenement has its own water-closet.* One room in each tenement is fitted with Barnard's "Diamond" range, in which bread can be baked, and cooking done. A coal-locker is placed in each tenement and a cupboard in each room.

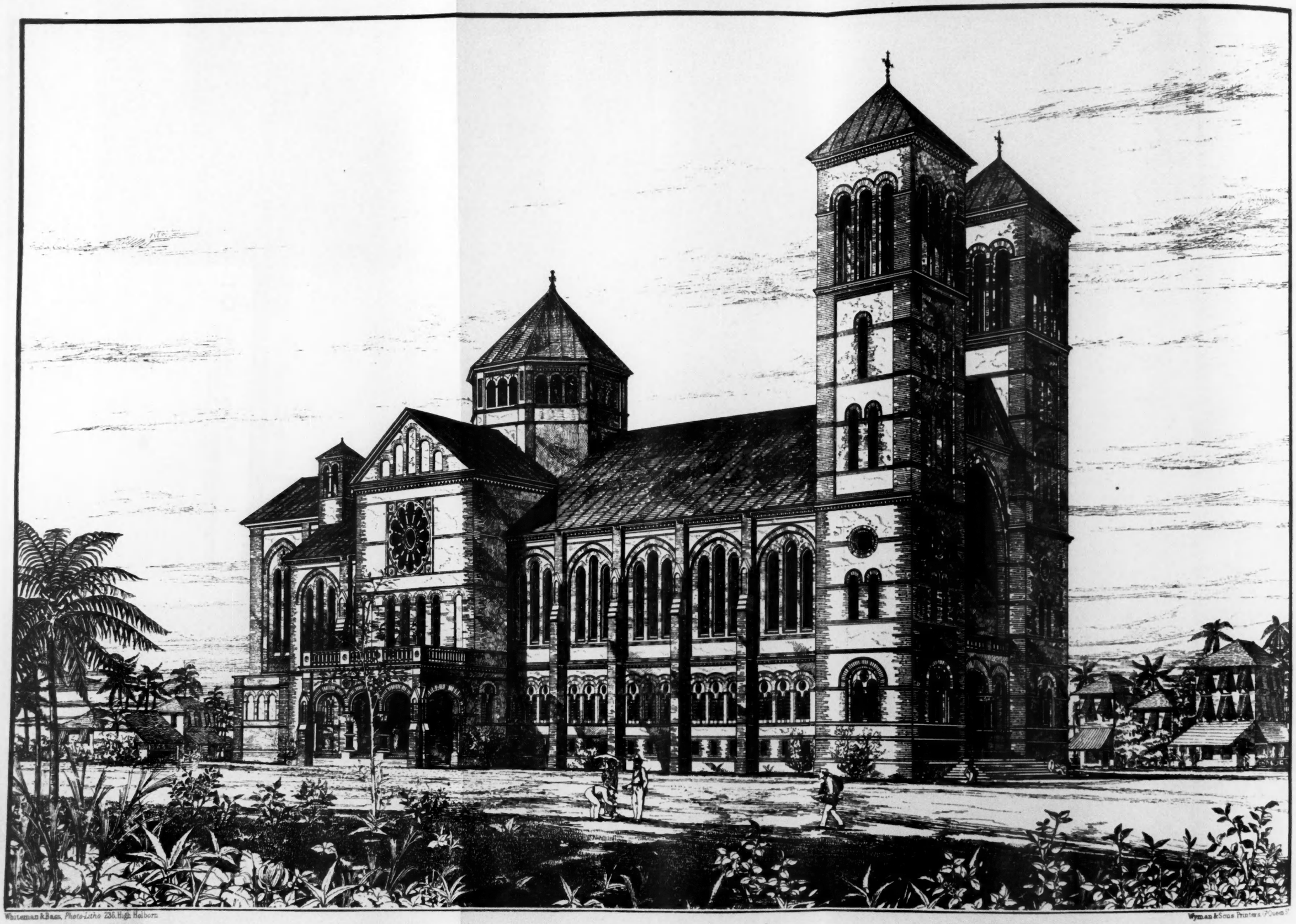
The cottages have each six rooms, with scullery and offices, and are treated in all respects as distinct houses. These dwellings appear to let well.

The exterior is faced with red brick, with moulded arches, strings, &c., and red tiled roofs. The intention has been to avoid the monotonous and dismal appearance usually presented by industrial dwellings, and to give a cheerful aspect to a large building on a conspicuous site for housing the working class.

* The position of the water-tap and sink at the end of the group of "closets" is open to objection.



SOUTH LAMBETH DWELLINGS, LAMBETH-ROAD.—Mr. E. Hoole, Architect.



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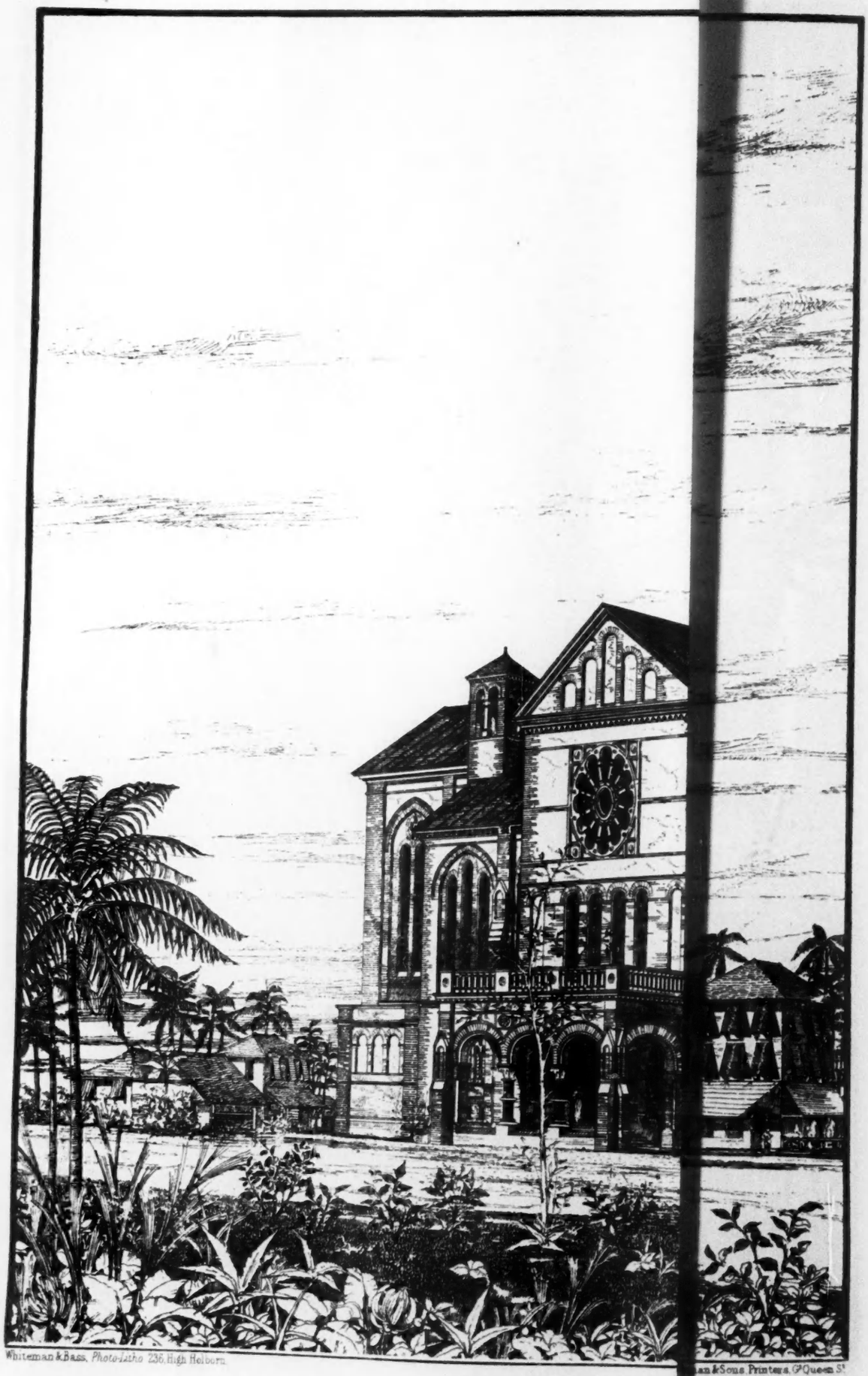
CATHEDRAL, GEORGE TOWN, DEMERARA.—MR. BLOMFIELD, M.A., ARCHITECT.



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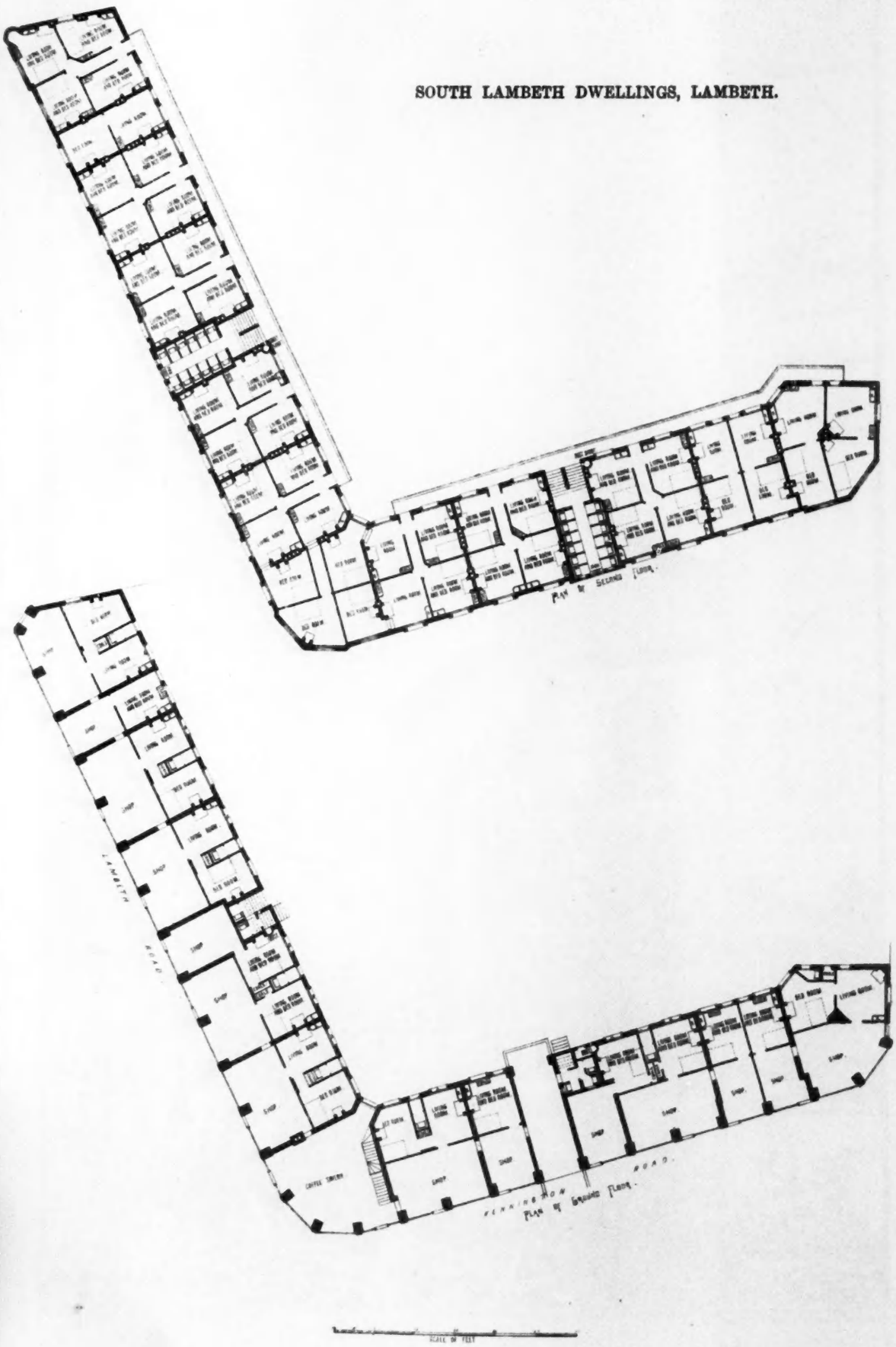
SOUTH LAMBETH DWELLINGS, LAMBETH.



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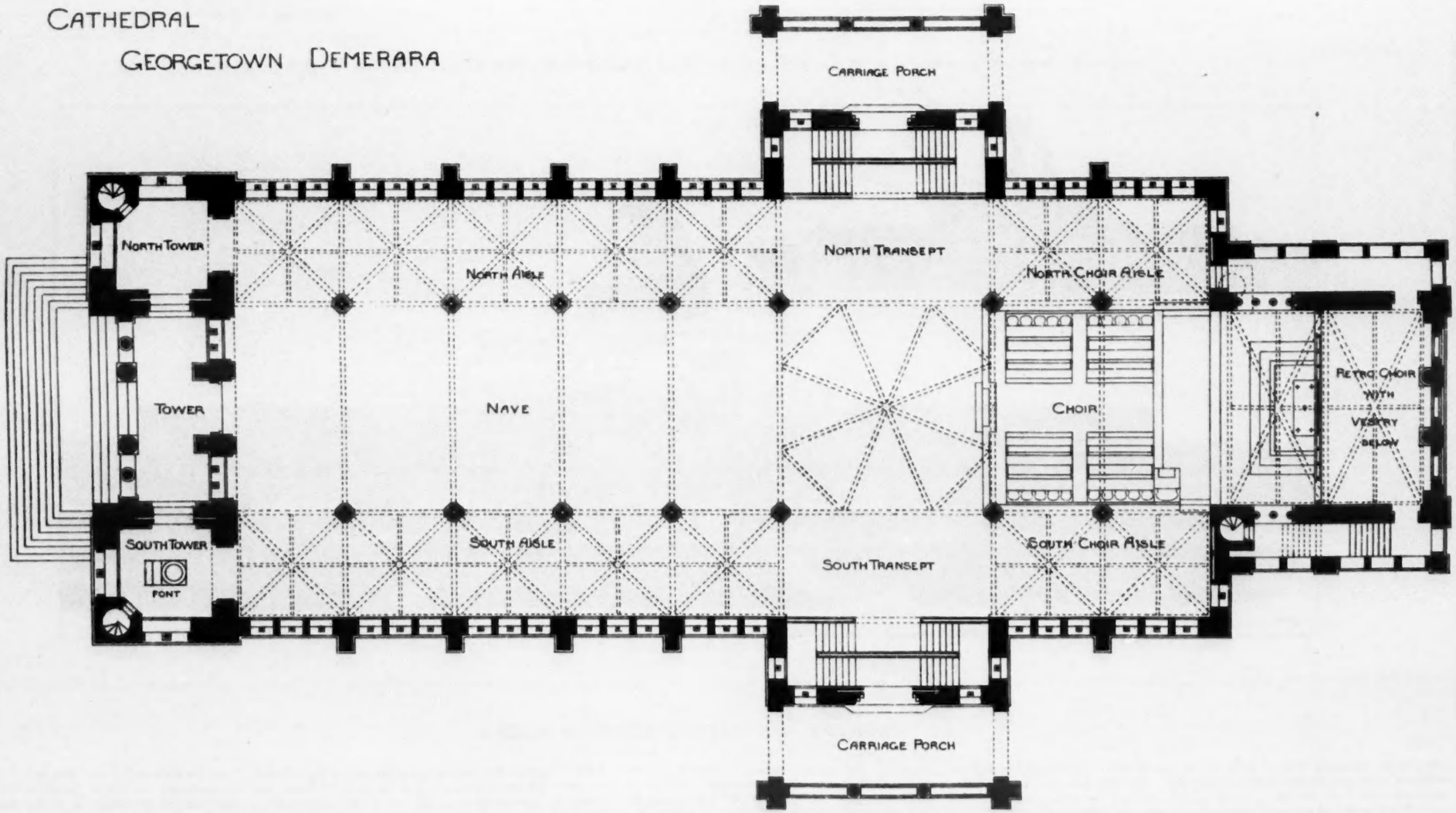
THE BUILDER, NOV. 5, 1881.

CATHEDRAL

GEORGETOWN DEMERARA



GROUND PLAN

SCALE OF FEET

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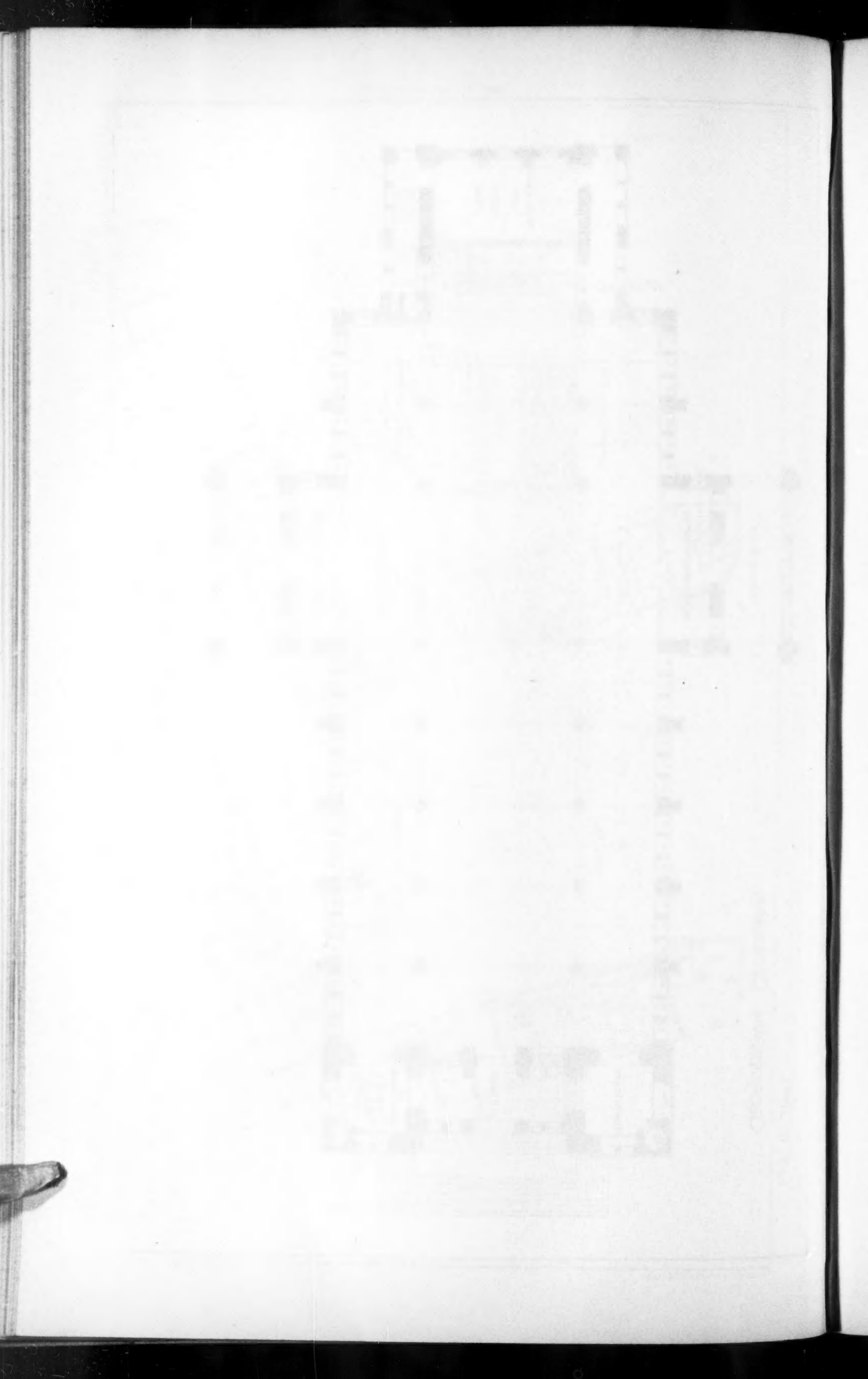
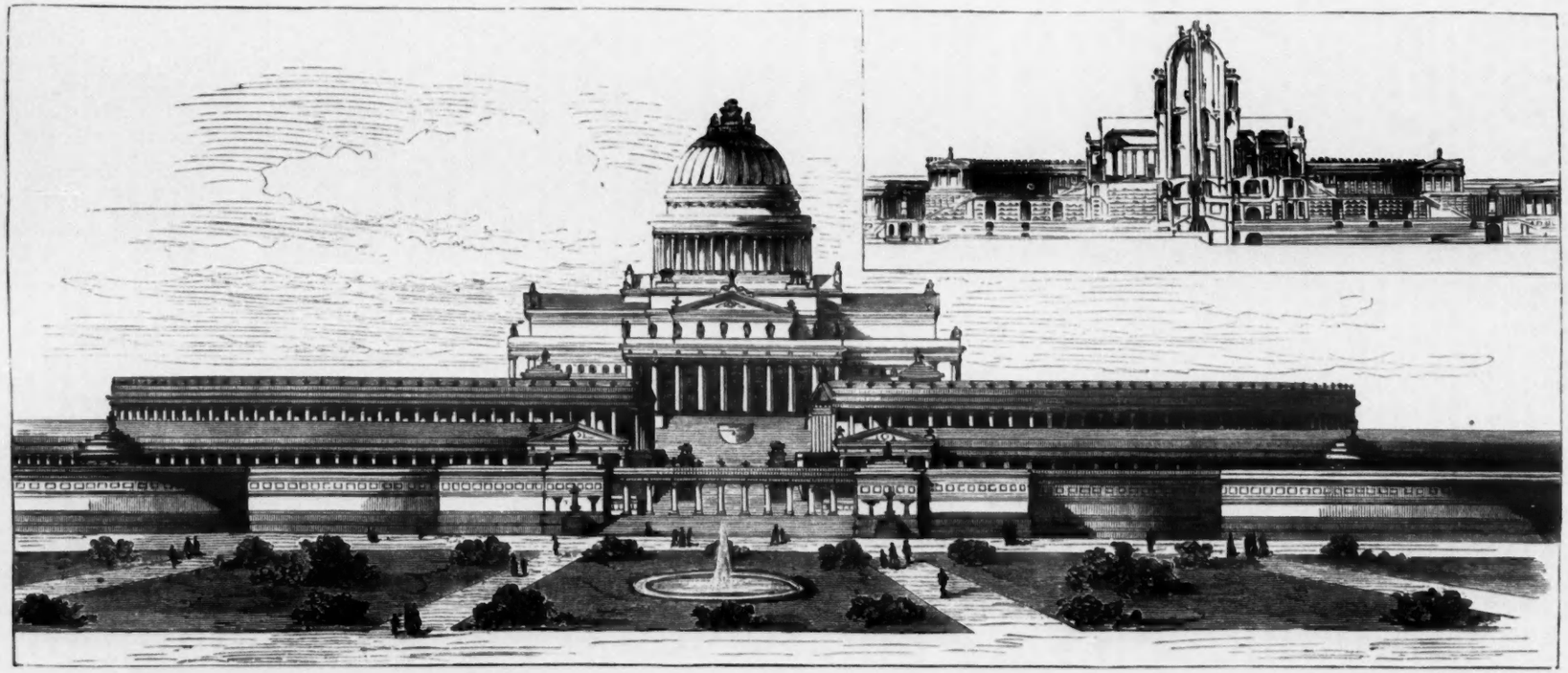


DESIGN FOR A CAMPO SANTO FOR INTERMENT AND CREMATION.—M. Adamczewski, Warsaw, Architect.



A CAMPO SANTO FOR INTERMENT AND CREMATION.

The first cremation, or "Feuerbestattung" (fire-burial),—the name by which the resuscitated mode of disposing of the dead by fire is now known,—took place in Germany on the 10th of December, 1878; but it cannot be said that since that date the movement has made much progress. On the one hand, it has to encounter a deep-seated prejudice. On the other, the expenses attaching to cremation are very heavy.

As now practised at Gotha, and under the regulations of the Government, fire-burial is rather expensive. About 50 cwt. of brown coal for preparing the gas are required, for which the prime cost of 50 marks is charged. In only one case have there been two successive burials at one heat,—to use a metallurgical expression; the second involving only an additional outlay of 20 marks for 20 cwt. of coal. A further 16 marks are put down for wear and tear of the combustion apparatus, and 14 marks for attendance. A provisional metal urn for holding the collected ashes costs 2 marks. A charge of 30 marks is made for conveying bodies sent from abroad from the railway station to the cemetery. The other expenses are incidental also to the ordinary mode of burial.

The architect, Adamczewski, of Warsaw, has attempted it, and has solicited the co-operation of the authorities at Gotha to make his plan public. He proposes to make the transition from burial or interment to cremation gradual and less repellant.

The building designed by him, of three stories, as shown in our illustration, is estimated to contain no fewer than 60,000 separate catacombs below and above the ground. The project is consequently only suitable for large cities, such as London, Paris, Berlin, Vienna, &c. The building is surmounted by a pantheon, the centre containing the furnace, which is to be kept burning continually, and which consumes the exhalations of the bodies interred in the catacombs, the latter being connected with the fire by air-conduits. A certain space of time, fixed by individual inclination, may thus be ensured during which a body is to be left undisturbed to the decay wrought by the agencies of nature.

We have been unable to get fuller particulars of the plan of the building, but we may add that, according to its author, it has obtained a prize.

CATHEDRAL, GEORGE TOWN, DEMERARA.

The new cathedral about to be erected at George Town, Demerara, of which illustrations are given in our present number, has been designed by Mr. Blomfield.

The requirements of the climate, which are somewhat peculiar, together with the entire absence of any building material except brick, while the funds are too limited to render possible the importation of stone or granite for the purpose, presented a problem somewhat difficult to solve without sacrificing the dignity of effect and the characteristic features which would be naturally looked for in an Anglican cathedral.

George Town being so near the equator, the widely-projecting eaves and the shady cloister-like verandahs usually associated with the idea of a cathedral in the tropics are not required on the sides of a building standing due east and west; nor is there any objection to large windows and the free admission of light. It is, however, not only necessary for the windows to open widely and freely, but the whole of the lower part of the building must be perforated with openings reaching nearly to the floor, and 8 ft. or 9 ft. high, allowing a free passage for the breeze which George Town is said never to be without. These openings are all fitted with iron louvre shutters easily closed not only to exclude the driving rain of sudden tropical showers, but also to keep out the bats at night, of which myriads infest churches and buildings into which they once gain an entrance. The floor of the building is raised about 7 ft. above the ground, which is much insisted on as affording greater facilities for thorough ventilation.

On the north and south are spacious carriage porches, which the climate renders essential features.

To preserve the cathedral character, the building is made cruciform on plan, with two western towers; but, with these exceptions and that of a retro-choir behind the altar-screen, the whole is treated as a large parish church, which indeed it will practically be, affording accommodation for about 1,200 worshippers without crowding.

The style of the building suggested itself as the most suitable to the climate and the materials proposed to be used.

The whole building might perhaps have been designed for construction in timber had it not been for the ants, of which there are two or three varieties, all equally destructive and insidious. A piece of timber may be to all appearance perfectly sound, though completely eaten away and nothing but dust left within. In the present design there is no timber within 30 ft. of the floor, so that no ant-track can be made to it without being speedily detected.

As stone or granite construction was out of the question on account of the cost, it was finally determined to build the walls of Portland cement concrete, a method of construction now beginning to be largely used and well understood in the colony. The quoins, arches, string-courses and cornices, are to be of brick, and the details of the lower arcading, and other ornamental portions, in terra-cotta sent from England.

The columns are of cast-iron, clustered and banded, and support timber posts and arches as well as the roof in one span externally, but internally divided into nave and aisles. The timber is to be pitch-pine, imported from North America. Internally, the nave and transepts have boarded and ribbed ceilings in a pointed wagon form, and the aisles and choir have wooden groined ceilings. Externally, the roofs are covered with galvanised iron, the roof-covering said to be found most suitable to the climate.

The cost of the building, exclusive of work below the ground-line, the upper part of the towers, and the fittings, is estimated at 20,000*l.*, and it is intended to make a commencement at once with the foundations and the choir. A reference to the ground-plan will explain the general arrangements more clearly than a verbal description.

The Corporation of Accrington have decided to apply to Parliament in the ensuing session for powers to construct about 7¼ miles of tramways, extensive intercepting and outfall sewers, precipitation works, a branch canal about a mile in length, and new store-yard, with stabling, sheds, and railway sidings. The plans are being prepared by Mr. E. Knowles, the Borough Engineer and Surveyor.

SOUTHAM.

On the 28th ult., the new sewage-disposal works were formally handed over by the engineer, Mr. Edward Pritchard, C.E., of Westminster and Birmingham, to the committee of the Southam Union Rural Sanitary Authority. The works comprised the laying of a main outfall sewer from the old tanks to new outfall grounds, and the preparation of the outfall grounds for the reception and purification of the sewage, which are comprised of three acres of land of a suitable description, situate near Old Ford Bridge, Welsh-road, about a mile from Southam, which had been purchased by the Sanitary Authority under the compulsory powers of the Public Health Act, 1875, and the Lands Clauses Consolidation Acts. The grounds have been formed into six beds of level formation, having properly-constructed deep drains, sewage-distributing carriers and chambers, and well-formed roads. The system of purification adopted is that of "intermittent filtration," which, whilst giving the best possible results in the purification, affords considerable facilities for the utilisation of the sewage by admitting the proper cultivation of green crops and roots upon the ridges between which the sewage flows, the whole of the beds being thrown up in ridges one yard apart, the sewage being distributed upon the beds from three chambers running down the centre of the ground, connected by disc valves, the pipes to the respective beds being connected with the chambers by flap-valves, so that the sewage can be distributed on any part of the grounds at the will of the manager of the works.

The cost of the works, inclusive of the purchase of the land, has been about 2,500*l.*

INDEX TO THE MINUTES OF PROCEEDINGS OF THE INSTITUTION OF CIVIL ENGINEERS.

We congratulate all who possess, or who have access to, the valuable professional library which is formed by the sixty-six volumes of the "Minutes of Proceedings of the Institution of Civil Engineers," on the completion of that desideratum,—a subject index. Each volume of the "Minutes" contains an elaborate index to its own contents, and there exists besides a general index from volume i. to volume xx., and a continuation of the same from volume xxi. to volume xxx. But the value of the later volumes, which are full of the most detailed, as well as of the newest matter, has been greatly enhanced by the completion of the new index. It may be judged how serious has been the work encountered by the index-makers from the fact that the book only comes down to volume lviii., showing that eight quarterly volumes have been issued, and two years have elapsed, since the index was so far put in form as not to be open for further additions.

It should be noted that the plan of the new index has enabled the secretary, Mr. Forrest, to condense the information given within 374 pages, while the old index for the first twenty volumes contains 367, and the supplementary index 206 pages. This condensation is the result, not of slovenliness, but of the reverse; very great judgment has been shown in the mode in which the fullest indications of the subjects indexed are given in the least space. But perhaps the chief cause of the economy of room is that the plan adopted has been to index subjects alone, the names of authors and of speakers being treated as subordinate. Their names, indeed, are fully given, but not as headings. For example,—in the old index six names of members of the Institution commence the letter G, occupying a third of a column, before the reader comes to "Galvanic Action." In the new index G commences "Galvanised Iron: see iron, wrought, preservation of," "Galvanometers: see electricity, voltaic, gas, coal, general references." Thus "the arrangement is essentially analytical, and the alphabetical arrangement has been combined with a certain amount of classification, thereby affording facility for consultation, by which it is hoped any given subject of inquiry may be reached with the least expenditure of time and trouble." And not only is the plan admirable, but, so far as we have been able to test it, it has been ably carried out.

It will be worth the consideration of the Council of the Institution whether they will not complete this valuable key to the *corpus* of their "Transactions" by printing a nominal index, which shall contain those nominal alphabetical references which are found in the two former volumes and omitted from the present one. In that case, the change now made will be of unmixed advantage. The labour of compiling such a nominal index will be small compared with that which must have been devoted to the volume before us. And while the subject index is a necessary intermediary between the world of readers and the volumes of Proceedings, the nominal index would form a perpetual commemoration of the founders and members of this important society.

THE INSTITUTION OF CIVIL ENGINEERS.

The Council of the Institution of Civil Engineers invite communications, of a complete and comprehensive character, on any of the subjects included in a list which they have published, as well as on other analogous questions. For approved original communications the Council will award premiums, arising out of special funds bequeathed for the purpose.

The Council have awarded the following premiums:—

For Papers read at the Ordinary Meetings.

1. George Stephenson medals and Telford premiums, to Thomas Forster Brown and George Frederick Adams, for their paper on "Deep Winning of Coal in South Wales."
2. A Watt medal and a Telford premium, to John Isaac Thornycroft, for his paper on "Torpedo Boats and Light Yachts for high-speed Steam Navigation."
3. A Telford medal and a Telford premium, to Theophilus Seyrig, for his paper on "The Different Modes of Erecting Iron Bridges."
4. A Telford medal and a Telford premium, to Max am Ende, for his paper on "The Weight and Limiting Dimensions of Girder Bridges."
5. A George Stephenson medal and a Telford premium, to Benjamin Baker,* for his paper on "The Actual Lateral Pressure of Earthwork."
6. A Telford premium, to Richard Henry Brunton,† for his paper on "The Production of Paraffin and Parraffin Oils."
7. A Telford premium, to Charles Colson,† for his paper on "Portsmouth Dockyard Extension Works."
8. A Telford premium, to Christian Hendrick Meyer, for his paper on the "Temporary Works and Plant at the Portsmouth Dockyard Extension."
9. A Telford premium, to Benjamin Walker, for his paper on "Machinery for Steel-making by the Bessemer and the Siemens Processes."
10. The Manby premium, to Joseph Prime Maxwell, for his paper on "New Zealand Government Railways."

For Papers printed in the Proceedings without being discussed.

1. A Telford medal and a Telford premium, to Dr. J. Weyrauch, for his paper on "The Calculation of Dimensions as depending on the Ultimate Working Strength of Materials."
2. A Telford premium, to James Richard Bell, for his paper on "The Empress Bridge over the Sutlej."
3. A Telford premium, to John Lewis Felix Target,† for his paper "Experiments on a New Form of Module for Irrigation purposes."
4. A Telford premium, to William Thomas Henney Carrington, for his paper on "Three Systems of Wire-rope Traasport."

LIVERPOOL ENGINEERING SOCIETY.

The usual fortnightly meeting of this Society was held last week at the Royal Institution, Colquitt-street, Mr. A. Holt, president, in the chair. A paper by Mr. Wm. Kissack, Stud. Inst. C.E., on the "Extension of the Promenade at Southport," was, in the absence of the author, read by the Hon. Secretary. The work, Parliamentary powers for which were obtained in 1876, consists of a promenade 25 ft.; carriage-road, 25 ft.; and footpath, 10 ft. wide, formed on an embankment 12 ft. above the level of the shore, enclosing 42 acres of land reclaimed by it. This land was bought by the Corporation at a cost of 9,000*l.*, roads and sewers have been constructed on it, the portion between the roads has been filled up to a height of 2 ft. above the top of the sewers, and is now being sold in building plots. By the sale of the land the Corporation will recoup the whole of the money expended on the works. The sand for the embankment was brought by a line of rails laid along the shore, from the sandhills at Birkdale, a distance of two miles and a half, being filled into the wagons by a steam "excavator," which filled 300 four-cube-yard wagons per day, thus doing the work of seventy men. The embankment is protected by a sea-wall made of concrete, consisting of 1 of Portland cement to 6 of sandstone broken to pass a 2-in. ring. The concrete was deposited in layers 6 in. thick, and punned with a 30 lb. rammer. The toe of the wall, which is 2 ft. 6 in. thick, is 20 ft. out from the face of the plinth, and it

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* Has previously received a Telford medal and a Telford premium.

† Have previously received Telford premiums.

rises with a gentle curve to the finished surface of the promenade, where it is 1 ft. 6 in. thick, and is finished with a plinth 2 ft. high, surmounted by an ornamental cast-iron railing. The top of the plinth is 8 ft. above high-water mark of a 21-ft. tide, which is the highest known, and is provided with "weep-holes" at intervals of 6 ft. There is an approach-road to the shore at Sea Bank-road, with a gradient of 1 in 15, and opposite each new street is a flight of steps in concrete. The promenade and carriageway are laid with asphalte on stone pitching, and the footwalk is tiled with Welsh fireclay tiles. The works, which comprise 400,000 cubic yards of embankment, 8,000 cubic yards of concrete, 24,000 square yards of asphalting, and four miles of sewers, have been carried out in a creditable manner by Messrs. Gripper & Bayliss, of Westminster, at a cost of 32,000*l.*, and are from the designs of the Borough Engineer, Mr. Wm. Crabtree, Assoc. M.Inst.C.E.

A vote of thanks to the author for his interesting paper was given.

THE GREAT EASTERN COMPANY'S NEW BRIDGE WORKS AT BRICK-LANE.

The old bridge which carries the Great Eastern Railway over Brick-lane is about to be taken down, and a new one of much larger dimensions, as regards both length and breadth, is to be erected in its place. The extension of the bridge has become necessary in carrying out the company's new goods station at Shoreditch, which has now for some time past been in progress. The intention of the company was to extend the present brick arch 23 ft. on the south side, and also to construct a new girder bridge on the north side, 40 ft. in width, and with the view of carrying out the works the company have recently placed themselves in communication with the Whitechapel and Bethnal-green Boards of Works, in whose districts respectively the contemplated extensions are situated. This has led to a conference between the representatives of the railway company and the local authorities, the result of which is that the present old brick arch carrying the line over Brick-lane, which it appears has for some time past been a subject of public complaint, is to be removed altogether, and an entirely new girder bridge erected, with extensions both north and south of the existing structure, having a uniform width across Brick-lane throughout its entire length, of 40 ft. In consideration of the railway company having agreed to demolish the old brick bridge, the local authorities undertake to bear a portion of the cost of the new structure. As regards the progress of these extensive station works, which were commenced upwards of three years ago, it is expected that it will yet take something like twelve months entirely to complete them. The station will occupy the large area of thirteen acres, its length from High-street, Shoreditch, to Brick-lane, being 1,400 ft. or upwards of a quarter of a mile, with a uniform width of 400 ft. The principal warehouse above the substructure covers an area of five acres, 10,000 tons of iron being used in its construction, and the outbuildings include, amongst others, a large fruit-shed, where the Continental fruit traffic, amounting in the busiest part of the season, to about 300 tons per day, will be received. In addition to purely station purposes, it is intended to utilise portions of the structure for market purposes, one side of the substructure being used as a potato-market, whilst it is said that the other side will in all probability form a large fish-market. The estimated total cost of the station when completed is 300,000*l.*

THE NEW ROYAL COURTS OF JUSTICE CHAMBERS.

In anticipation of the completion and opening of the new Law Courts next year, the work of clearing a site on the opposite side of the Strand, preparatory to the erection of the Royal Courts of Justice Chambers, has been commenced within the last few days. The company which has been formed for the erection of the building held its first meeting a few days since, at the offices in Devereux-court, Temple, when Mr. Morgan Lloyd, Q.C., who presided, stated that 54,330*l.* of the authorised capital of 80,000*l.* had already been subscribed. He said the architects estimated that the works would cost 55,000*l.*, and they had assured the Board that such sum would cover the entire cost of the building. The present subscribed capital was therefore very nearly enough for the purpose, and if the architects were right in their calculations, very little more capital would be required, and so far as the works had proceeded, the contracts had been let at sums within the estimates. The contracts already let were for the demolition of the old buildings and for the excavations, and also laying the foundations to the height of 5 ft., which were let for about 6,000*l.* to responsible contractors. The excavations would have to reach a sufficient depth to provide for two floors below the present level of the ground. In reply to an inquiry from a shareholder, the chairman said the directors had not yet secured a right to make a subway under the Strand, but the matter was under the consideration of the Board of Works.

In addition to the several blocks of property opposite the Law Courts which are being cleared away for the new chambers, a large number of offices and other buildings, extending a considerable depth southwards, are likewise in course of demolition.

THE LATE WILLIAM BRODIE, R.S.A.

On Saturday, the 29th ult., Mr. William Brodie who for many years, held a foremost place amongst Scottish sculptors, died at his house in Edinburgh. He was a native of Banff, and commenced life as a plumber and gasfitter. He was imbued with an intense love of the beautiful, and came to Edinburgh, with the purpose of prosecuting his art-studies, about forty years ago. For ten years he toiled hard, scarcely earning sufficient to support existence, and almost unnoticed and unknown. In 1851 he sent a statuette group of "Nell and her Grandfather" to the Great Exhibition, and it was consigned to the obscurity of the lumber of one of the spare galleries. Year after year he sent his works to the Royal Scottish Academy Exhibition; a few were admitted, but he found neither purchasers nor patrons. One afternoon the writer of this notice called on him, and found him in his studio disconsolately gazing on his exhibits that had been returned that morning from the galleries of the Academy Exhibition. "High art," he said, "won't keep my wife and me and the bairns, so I'll go back to the gaspipes and plumbing." "Ye'll be a great man yet, Willie, if you would only keep up your heart. You stick to your art and I'll stick to you and the bairns, and I'll see that none of us ever come to want," said his wife; but the only reply to her cheery words and encouraging smile was a sad shake of the head. The writer spoke a few consolatory words and, with a promise to call on the following day, left. By the forenoon of the morrow the scene in the studio was changed,—the sculptor and his wife were in tears, they were almost too happy to speak. In the meantime, an Edinburgh merchant had called on Mr. Brodie, and after telling him how much he appreciated his talent and regretted his want of success, handed him a bank-cheque. "That, Mr. Brodie, will enable you to go to Rome and devote two years to study. In your absence I will see that all proper attention is paid to your wife and children." Brodie went, studied, and returned to take rank among the foremost of Scottish sculptors. Up to within a year of his death, William Brodie was constantly employed over works which vividly displayed his appreciation of beauty and tenderness. Many of the statues which fill the niches of the Scott Monument in Edinburgh, the design and erection of his friend George Kemp, were the work of William Brodie, who, at the time of his death, held the office of secretary to the Royal Scottish Academy. He was in the sixty-seventh year.

THE LATE MR. G. R. FRENCH.

We regret to have to announce the death of Mr. George Russell French, architect, who expired on the 14th of October, after a long and painful illness, and was interred at the Willesden Cemetery. In his early career he was engaged in designing and superintending the erection of several mansions and other buildings for noblemen and gentlemen. For many years he acted as surveyor to the Worshipful Company of Ironmongers, and within the last few years retired on a pension. Mr. French entered into several important competitions; for example, the new Houses of Parliament and other buildings. He will, however, be better remembered by his literary labours than his professional practice. He was one of the earliest contributors to the *Builder*, and author of several pamphlets. One entitled "The Palace, the National Gallery, and the Royal Academy," which in 1846 appeared in the *Builder*, in five letters, received favourable notice from the public press, and created much discussion. His chief works comprise a "Genealogical History of England," "Shakspeareana Genealogica," published in 1869, as a supplement to the Cambridge edition of Shakspeare, and a "Catalogue of the Antiquities and Works of Art exhibited at Ironmongers' Hall, London," in 1861, which contains, in addition to numerous illustrations, a store of archæological knowledge. Mr. French was seventy-eight years of age, and died a bachelor.

FRIEDRICH HITZIG.

This noted German architect and artist, who died on the 11th ult., in his seventy-first year, was buried in the same Berlin cemetery in which the remains of his master, Schinkel, lie. The obsequies were attended by several Ministers of State, the members of the Royal Berlin Academy of Arts, of which the deceased was president, and of the Berlin Academy of Architecture, of which he was vice-president, and a large number of architects, artists, and other distinguished persons,—ample testimony to the wide and deep respect in which Friedrich Hitzig was held by his contemporaries. Hitzig may be regarded as the last representative of the Berlin school which arose under the influence of Schinkel. He was the creator of many important works, in which all the varieties of his particular school are well represented. His two last works were the entire reconstruction of the Zeughaus, and the plan for the new Technical High School, both at Berlin. The former he lived to complete, the latter he has left in course of erection. Both works are well worthy of his reputation. Hitzig was of late years the acknowledged head of the entire sphere of arts and architecture in the German capital.

ROBERT HOOKE, ARCHITECT.

How much the London of to-day differs from the London of fifty years ago can scarcely be credited except by those who are old enough to remember its appearance during the reign of George IV. At that time the chief features of the city,—the churches, public buildings, and streets,—presented almost the same aspect to the citizens and wayfarers as they had done during the previous hundred and fifty years; it was the city that arose from the ashes of the Great Fire in 1666. But the removal of the houses in old St. Martin's-le-Grand, to make room for the erection of the General Post Office, and the making of the approaches to new London Bridge, were the beginning of a march of improvement and alteration which has continued until the present time, and goes on at an ever-increasing rate; so that by the commencement of the next century the city, with its palatial offices, gigantic railway stations and trading emporiums, will present an appearance differing far more widely from the London of the Georges than that did from the London of Queen Elizabeth and Shakespeare's days. While some of the houses and streets which are associated with so much that is interesting in our domestic history during the last two centuries yet remain, I venture to ask whether Robert Hooke was employed as architect, and to what extent he assisted in the rebuilding of the city. He is best known by his scientific researches and wonderful mechanical contrivances; but that he attained some fame as an architect is proved by the erection, from his designs, of three large buildings in what were then the suburbs of London. These were Bethlehem Hospital, in Moorfields, erected at a cost of 17,000*l.*, which remained until 1814, when it was taken down and Finsbury formed on the ground; Montague House, Bloomsbury, built in 1678 for Ralph, third Baron of that name (this building was unfortunately destroyed by fire a few years after its construction, but John Evelyn, in his "Diary," speaks of it as a "fine palace built after the French style"), on the site of which the British Museum now stands; and Aske's Almshouses, at Hoxton, an important building, erected for the Haberdashers' Company. For this last work Hooke is said to have been recommended by Arch-

bishop Tenison. Hooke, as well as John Evelyn and Mr. (afterwards Sir) Christopher Wren, after the Fire submitted plans for the rebuilding of the city; and although Wren's scheme was approved by the King, Hooke's model, which was submitted to the Royal Society, found such favour among the civic authorities that it led to his appointment as Surveyor to the Corporation, in which capacity he toiled early and late in laying out the ground for the several proprietors. When a young man, his abilities attracted the attention of Boyle, Wren, and others at Oxford, and his mechanical ingenuity and penetrative sagacity must have been of value in the early days of experimental philosophy. If we consider the large number of churches, in addition to the cathedral, that were erected from the designs of Wren, it is evident that his time must have been fully occupied; and it is from Hooke's intimate connexion with Wren during many years that I am led to infer that many other structures, besides those already mentioned, were built from Hooke's designs, although I have never met with any notice of them.

THOS. J. HUX.*

THE LONDON, CHATHAM, AND DOVER RAILWAY, AND THE NEW VEGETABLE MARKET.

THERE appears to be a strong probability that the opening of the new Fruit and Vegetable Market in Farringdon-street will be the means of adding considerably to the merchandise traffic of the London, Chatham, & Dover Railway Company. That portion of the company's line between Ludgate-hill and the Moorgate-street and Farringdon-street stations, runs parallel with the market on the east side, on a sharp descending gradient, the level of the railway at this point being about equal with that of the basement of the market. This admits of the railway company obaining easy access to the market basement, which we are informed they have taken advantage of by becoming the lessees of a considerable area of the basement, and that they are converting it into a depot for fruit and vegetables, which they contemplate bringing to the market from the several districts in Kent intersected by the railway. For the reception of this class of traffic four lines of railway are at present being laid down, which will afford accommodation for a large number of fruit and vegetable-laden wagons. As Kent is proverbially known as "The Garden of England" it may reasonably be supposed that the market will be very largely supplied from this district, and that the traffic receipts of the Chatham & Dover Company will be correspondingly increased.

SWINDON.

THE cemetery for this rapidly-increasing town is now complete. The site, eleven acres in extent, is charmingly situated on the side of a hill, and from which a splendid view is obtained. The buildings consist of chapel, caretaker's lodge, and mortuary, and are built of local stone, with Bath-stone dressings. The chapel is in the style of the thirteenth century, and will accommodate 100 persons. It has an apsidal end, and a bell-turret. The roof is covered with Bangor slates, with bands of "Eureka" green. The fittings are of pitch-pine; the tiles are from Minton, Hollins, & Co.; and the cresting and finials from Messrs. Cooper & Son, of Maidenhead. The carving has been executed by Mr. Chapman, of Bath. There are four entrances, conveniently situated for access from all parts of the town, and the whole site is enclosed by a substantial iron fence, 8 ft. high, with dwarf wall and stone piers. The drainage consists of agricultural pipes laid 9 ft. deep and 30 ft. apart, and connected to 9 in. mains, and in excavating for these a large number of boulder stones were found, and the ground being "pricked" over for them, some 5,000 tons were got out, and used in the road-making.

The work has been carried out from the designs and under the superintendence of Mr. W. H. Read, architect, of Swindon, whose plans were selected in a limited competition. The contractors are Messrs. Phillips & Powell and G. Wiltshire jointly, and Mr. Gilling has acted as clerk of the works. The iron fencing and gates are by Mr. Affleck and Messrs. Edwards & Co., of Swindon; and the grounds have been planted by Mr. Tucker, nurseryman, of Faringdon. The total cost is about 10,000*l.*

* *From Notes and Queries.*

FULMODESTON CHURCH.

THE new Church at Fulmodeston, Norfolk, consecrated on the 19th ult., is erected in the middle of the village, and is intended to supersede the old church, which is very inconveniently situated, and which will for the future be used only for the burial service for funerals in the old churchyard.

The new church consists of a nave and chancel, a south aisle, with three arches opening into the nave, a vestry or chancel aisle, also on the south side, and shut off from the aisle and chancel by ornamental screens. On the north side there is a porch. The style adopted is late fourteenth century. The walls are built of flint, with Bath and Ancaster stone dressings, and internally they are lined with red bricks, with patterns of white bricks. There are open-timber roofs, that of the chancel being panelled and boarded.

At the east end there is a stone reredos, with columns of polished alabaster. The pulpit is also of stone, and has an alabaster cornice and columns. The font is an old thirteenth-century base and columns, with the bowl renewed in accordance with the old. Until now it has stood for many years in the churchyard to Croxton Chapel, Norfolk.

The outer doorway to the porch is also old, and was brought from the old church at Fulmodeston, and re-used. The seats in the nave and chancel are new (oak being used in the chancel). Those in the aisle were brought out of Croxton Chapel and refixed. The altar table and rail were also brought from Fulmodeston old church.

The whole of the works have been executed by Messrs. Cornish & Gaymer, of North Walsham, Norfolk, under the direction of the architect, Mr. Wm. Bassett Smith, John-street, Adelphi.

A NEW WESLEYAN CHAPEL FOR NEWCASTLE-UPON-TYNE.

THE Wesleyan Methodists of West Jesmond, Newcastle-upon-Tyne, after worshipping for some years in a temporary iron church, have just laid the memorial stones of a new chapel and lecture-hall. This is part of a project embracing the sweeping away of the debt upon Brunswick Place Chapel, requiring about 13,500*l.* The committee entrusted with the carrying out of the new works some few months back resolved upon inviting a number of London and provincial architects of well-known repute in church building to furnish them with designs from which they might select the one best adapted to the exigencies of the site. The result of the competition was that they awarded the first premium to the design submitted by Mr. J. J. Lish, architect, Newcastle-upon-Tyne.

A lofty tower forms part of the design, and provision is to be made for the placing of a clock in it, high above all neighbouring roofs and obstacles. The chapel will consist of a nave, aisles, and transepts. Behind, or to the south of the main buildings, will be three large class-meeting vestries, a ladies' vestry with cloak-room adjoining, a minister's vestry with lavatory, a "mothers' meeting" vestry, and a tea-preparing room. The contractors entrusted with the carrying out of the works are Messrs. Lishman & Salter, Ryton-on-Tyne.

BOROUGH ENGINEERS.

MR. ALFRED M. FOWLER, Borough Engineer of Newcastle-upon-Tyne, complains strongly of the obstacles which have been thrown in the way of the proper discharge of his duty, and has addressed a letter to the Council to denounce the present state of things. Mr. Fowler says he has never had full charge and control of the business and staff. The want of a proper understanding on one side or the other is evident.

The Surveyors' Institution.—The first ordinary general meeting of the session will be held on Monday, November 14th, 1881, when the president, Mr. Edward Ryde, will open the session with an address.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,503. C. Gall, Halifax. Construction of safety apparatus and fasteners for windows, &c. Oct. 15, 1881.

4,511. B. R. Harrington, Beckenham. Ventilating gullies for drains. Oct. 15, 1881.

4,512. W. A. McCormick, Stoke Newington. Regulating the supply of water to water-closets, &c. Oct. 15, 1881.

4,526. P. Everitt, Great Ryburgh, and A. Barnard, Norwich. Stoves and grates. Oct. 17, 1881.

4,551. G. E. Waring, Newport, U.S.A. Water-closets. Oct. 18, 1881.

4,557. J. A. Hornby, Menai Bridge. Water-closets. Oct. 19, 1881.

4,565. W. M. Farley and J. H. Bond, Torquay. Apparatus for supplying dwelling-houses, &c., with water. Oct. 19, 1881.

4,566. W. A. Martin, Southwark. Open fire-grates. Oct. 19, 1881.

4,568. H. Skerrett, Birmingham. Combining door chains with lock, latches, and bolts. Oct. 19, 1881.

4,578. W. A. Barlow, London. Stoves. (Com. by F. Lonholdt, Frankfort-on-the-Maine). Oct. 19, 1881.

4,590. F. Wirth, Frankfort-on-the-Maine. Chimney-flues. (Com. by the Society "Gesellschaft des Emser Blei- und Silberwerks, Ems, Germany.") Oct. 20, 1881.

4,595. J. G. Shillingworth, London. Sash-fasteners. Oct. 20, 1881.

4,598. G. Pitt, Sutton. Water-closets. (Com. by J. Finck, Baden-Baden.) Oct. 20, 1881.

4,603. Capt. T. E. Clarke, Minehead. Fire-grates. Oct. 20, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

October 18, 1881.

2,809. W. Joy, Aylesford. Manufacture of cement. June 27, 1881.

3,250. D. Grove, Berlin. Steam-cooking apparatus. July 25, 1881.

3,357. C. Walton, Bournemouth. Apparatus for preparing clay, &c., and making bricks, tiles, &c. Aug. 3, 1881.

3,383. J. Shanks, Barrhead. Lavatories. Aug. 4, 1881.

4,001. J. Shanks, Barrhead. Baths, sinks, &c. Sept. 16, 1881.

October 21, 1881.

2,616. G. Hodson, Loughborough. Manufacturer of chimney-pieces, &c., in imitation of marbles, &c. June 16, 1881.

2,633. S. Hodgkinson, Manchester. Window-blinds. June 16, 1881.

3,630. C. Drake, Battersea. Facing bricks. Aug. 20, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 22, 1881.

747. H. Dafty, Middlesbrough. Stoves.

The fire-grate is enclosed in a transparent shell or doors so that all air for combustion passes from the back or bottom to the grate. The ovens or boilers are placed above the fire, and a number of small chambers are arranged above to heat air which passes through them and can be led by tubes to any other room. (*Pro. Pro.*) Feb. 22, 1881. Price 2*d.*

969. R. Crane, Clapham. Grates and stoves.

The flues from the grate pass down again on each side under the bottom of the fire and thence up the back, whereby the smoke is consumed. March 7, 1881. Price 4*d.*

1,073. G. P. Lempriere, Birmingham. Mechanism for producing tension on the cords or bands of blind rollers, &c.

A helical spring is used, in the axis of which is a screw. The lower end of the spring engages in the groove between the threads of the screw. The upper end of the spring constitutes the axis on which the pulley turns. The screw and the greater part of the spring are contained in a case. By turning the screw a greater or less amount of tension is given to the spring and thereby tightens or loosens the cord. (*Pro. Pro.*) March 13, 1881. Price 2*d.*

1,091. A. M. Clark, London. Tiling for roofs, floors, &c.

Grooves are made all round the edges of the tiles; and metallic feathers, inserted in the grooves and bedded with elastic cement, connect the tiles together, keep them in their proper positions, and make the joints watertight. (Com. by J. J. Williams, Fairhaven, U.S.A.) March 14, 1881. Price 6*d.*

1,098. J. Elms, London. Water-closets.

A lower pan is fitted beneath the upper one, and a double-action crank, raised by the ordinary pull, opens the

* Compiled by Hart & Co., patent agents, 29, New Bridge-street, E.C.

upper one, and at the same time closes the lower one and *vice versâ*. The up-flow of noxious gases is thereby prevented. (*Pro. Pro.*) March 14, 1881. Price 2d.

1,112. S. C. Joyce, Wood-green. Surfacing asphalte, &c., to render the same slipless.

A diamond pattern is cut into the asphalte while it is warm. This is either left open or filled in with cement, &c. (*Pro. Pro.*) March 15, 1881. Price 2d.

1,142. R. Marshall, Wandsworth. Appliances for operating Venetian and other blinds.

To the top rail is fixed a bracket, which is slotted. In the slot is a spindle carrying the top and the other laths of the blind. The usual cords and wheels are in the top rail for raising or lowering the blind. (*Pro. Pro.*) March 16, 1881. Price 2d.

1,146. A. Sweet, Hampstead. Water-heaters.

The heater is a cylinder with an inner lining forming a waterway jacket. The water passing through this jacket overflows into one of a series of circular-bearing chambers falling through tubes from one to another, until it reaches the boiling-plate, when it is drawn off. The gasburner is composed of a series of rings, into which are screwed a number of fish-tail burners. A condensation-plate of fireclay is placed above these. March 16, 1881. Price 6d.

1,149. L. S. Powell, Notting-hill, and C. V. Boys, Oakham. Water-pipes.

These are made of elliptical section, so that under the strain produced by the freezing of the water, they will not burst, but yield; and after the strain is removed will return to their original form. (*Pro. Pro.*) March 16, 1881. Price 2d.

1,155. S. J. Payne, Charlton. Manufacture of fire-bricks, &c.

These are made of the following materials:—Clay, graphite, or sand, &c., 7 lb.; Portland cement or hydraulic lime, 1 lb.; silicate of soda, ¼ pint. These are thoroughly mixed and moulded into the desired shapes, and afterwards hardened. After this the goods are immersed in a weak preparation of carbonate of magnesia or silicate of soda. March 16, 1881. Price 4d.

1,171. J. H. Johnson, London. Cocks, valves, or apparatus for regulating the flow of liquids.

The main valve is closed by the pressure of the water in the pipe, and a small valve and passage are fitted to allow the water to enter the chamber below the main-valve piston, and by equalising the pressure to lift it off its seat when the water flows through the main valve. (Com. by J. Zeleny, Prague). (*Pro. Pro.*) March 17, 1881. Price 2d.

1,193. W. S. Smith, Highgate. Locks.

To allow of a strong spring being used, a spring catch is combined with the lock which when the bolt is withdrawn by turning the lock handle, springs in front of the end of the bolt and prevents it from being again shot forward when the handle is released. (*Pro. Pro.*) March 18, 1881. Price 2d.

1,781. A. Bell, Edinburgh. Castors.

The castor is made in two parts. The upper part fitted to the leg of the table, chair, &c., and the lower forked swivelling bracket-piece carrying the roller. The upper part has a centre pin or stud, which fits a corresponding socket in the centre of the lower part. A pin passes through the socket and enters a groove formed round the centre pin and holds the two parts together. April 25, 1881. Price 4d.

"THE VICTORY OVER SEWER-GAS."

SIR,—As the opener of this discussion, I hope you will allow me to reply to Mr. Cosmo Innes's criticism in your last issue [p. 558].

1. As to the weight of sewer gas: that depends entirely upon circumstances, and varies in accordance with the cleanness or foulness of house-drains, soil-pipes, and traps under w.c.'s, so that the specific gravity is always varying; but what I contend is, that air impregnated with sewer gas is always heavier than fresh air, and that where there is a current of air either up or down a soil-pipe, its temperature varies but slightly from that of the surrounding atmosphere. The temperature in my soil-pipe this morning was 35 degrees, exactly the same as it was on my roof or the road adjoining my house, proving, I suppose, an entire absence of sewer gas.

2. The temperature of the main drain opposite Sir Henry Cole's house, taken in his presence this morning (Oct. 31st) at 9.30, was 45 degrees: so what the weight of carbonic acid gas at 100 degrees and the ventilation of monkey-houses has to do with this discussion I fail to perceive. I am not engaged in ventilating monkey-houses, so have no desire to dispute Mr. Innes' superior knowledge on that subject.

3. I have myself called attention to the different opinions of the doctors as to the general direction of the air in soil-pipes. Mr. Innes may read more fully in the report already alluded to viz., Conference, May 3rd and 4th, 1877, or, even in the *Builder* of last Saturday, Oct. 29th, p. 537, on the Sanitary Congress at Vienna, where Dr. von Roszahegyi, of Pesth, remarked that his own practical experiments led him to the conclusion that the air in drains is carried forward with the stream, while currents of air in a contrary direction are unfrequent and limited in extent, and no perceptible influence is exercised by wind, or by the temperature of the exterior air. Dr. Lissauer, of Dantzic, fully confirmed the preceding speaker's remarks; but I leave the doctors to differ, not feeling it any duty of mine to endeavour to reconcile their differences, though I feel sure the preponderance of scientific opinion is on my side in this controversy.

4. Mr. Innes says a better plan than mine would be to take it up a warm chimney. Does he not know that there is not one chimney in ten that is built straight enough to take an up-cast ventilating-pipe through, and when he had found one straight enough, he would find no room to spare for his pipe, and still less would he be able to get his pipe up, or make good any joints in it? A moment's reflection will convince your readers, both builders and architects, that the idea is impracticable; and as for carrying the sewer gas up the chimney without a pipe, let them read the short paragraph on "Defects in House Building," by R. K. Hervey, in the next page of the *Builder* to that on which Mr. Innes's letter appears (p. 559), and fancy the effects of sewer gas as well as smoke being constantly pouring into the house.

5. Mr. Innes himself admits all that I contend for, viz.,—1st. That the current up a soil-pipe (when it exists) is in the majority of cases a feeble one. 2nd. That the said current is reversed when the w.c.s are used, and a flush of water sent down the soil-pipe. 3rd. That the air thus reversed is poured out through its intended inlet in the front area; but he says this does no harm, because (mark you) it is not often that anybody is standing over it at the time; also because, if the pipes and drains are kept well flushed and clean, he (the poisoned one) will not perceive any smell. Is this the standard set up by the much-talked-of Sanitary Protection Association, to tolerate an imperfect system, on the chance that no one will be near when the poison is poured forth, or if any one is, then if the poison is very diluted he will not smell it? (I have never heard anything worse from the lips of a fourth-rate speculating builder.) If this is the best the London Sanitary Protection Association can do for us, then Heaven protect us from such protectors!

6. Mr. Innes thinks I am a practical man. I wish I could return the compliment. I should say that my theory is based on practice, and Mr. Innes's practice is based on theory. My practice has been on my own houses, at my own cost, and on my own responsibility. Mr. Innes's Association theorises at other folks' expense, and is not responsible for results.

Then, the bugbear of cost. The Association asks its members to pay a guinea per annum to be told, not what is best to be done, but what is cheapest and near enough (the gospel of shoddy speculation), but when I develop a plan by which the volume of air in the soil-pipes and house-drains can be changed two or three times per minute, with no reversal of the current induced, with both inlet and outlet above the level of all the windows, and by which the traps or cesspools under the w.c.s can be safely dispensed with, but which would cost from two guineas to two guineas and a half per annum (not for advice, but for continuous and efficient working), then it is found too expensive, and is compared to a steam-hammer to crack nuts with; but he admits that it does crack the nut, he admits that it is a victory over sewer gas, and that is sufficient for me. I contend that this nut has not been successfully cracked by any previous method.

In concluding this correspondence for the present, I may state that I shall be very pleased to show the system working at my residence, No. 97, Warwick-road, Earl's-court, S.W., to any one, architect or builder, who is desirous of seeing for himself, and wants the best thing; if, on the contrary, he wants the cheapest, then I am not in it, and it would be useless to trouble himself or me about it. I shall go on with my experiments, and if I meet with further success, you will probably hear of it.

G. E. MINEARD.

SIR,—As a practical man of many years' standing, and one who has studied the subject of drainage and ventilation for more than twenty years, I can endorse every part of Mr. Cosmo Innes's statements, contained in your issue of the 29th ult., excepting that in addition to where the closets are in use, I have found the action of the air in the soil-pipe at times reversed; but, as he states, with no bad effect (when the work is done properly). I have stood over the inlet ventilator or sewer interceptor, as the case may be, in a confined yard when the closets were in action without experiencing the slightest smell; but as the result of a practical test,—that sewer-gas does generally ascend is fully proved by the fact that the tops of the closet-traps and outgoings (under the old system) are the parts first found to be perforated G. T. USHER.

COALS FOR DOMESTIC FIRES IN LONDON AND COAL MERCHANTS.

IN offering some remarks on "Strawberry Leaves and Black Diamonds," I beg to say that I individually wish success to the venture of Lord Londonderry in boarding the London coal-dealing ring. I am not, however, satisfied that the Marquess will be allowed to hold his own, let alone win. Rings are not easily broken down.

In the first place I may remark that "Wallsend" is now a name,—nothing more,—the seams of coal at Wallsend having been worked out. The coal sent to London by the Marquess may, however, be of good quality for household purposes; but it will not be true Wallsend. Every London coal-dealer may, therefore, strike this term out of his list. "Silkstone" is a good coal for domestic fire purposes, and may take rank with the so-called Wallsend. There are, however, many varieties of coal, all differing in quality,—and of course, to the coal-merchant, in price. Some of these coals are wasteful and dirty, and the coal-merchants do not scruple to substitute the bad for the good, either wholly or by mixture.

I have been a resident and householder in London some thirty years, and up to this time have failed to find one consistently honest dealer, who would supply me with the best coal for the best price. I order and pay for Wallsend or Silkstone, and I may for a time obtain good and clean coal; but, sooner or later, when nine tons or twelve tons have been ordered, delivered, and paid for, they turn out to be dirty, dusty, white-ashy rubbish,—and I am fixed for the winter with coal at 24*s.* a ton which I would not give 15*s.* a ton for,—indeed, would not have in my cellar if I could help it. This is my condition at this time. The coals ordered and paid for were to have been Best Silkstone; they are simply rubbish. Of course, the dealer will have no further order from me, but by change I do not find permanent improvement. I therefore, with all my heart, wish success to the Marquess, but I see rocks ahead. The ring will resort to some dodge to reduce the supply the public should get. But suppose the sale is allowed to be open and fair, the demand will far exceed the power of supply, and orders must go unattended to, and, as waiting will not suit householders, they must go to the dealers.

It is really most disgraceful that in England a man cannot be supplied with what he orders, though he makes no demur about the price, and is prompt in payment, but must find his cellars filled with the commonest coals when he ordered and paid for the best. I suppose, however, that it is with coals as with many other things, there is not sufficient of the best to supply the demand. If this is so, the householder who has ordered the best should be told so, and should be honestly told what sort of coals he can have and the price. If then coals and price are accepted there can be no just ground for complaint.

A CHEATED AND INDIGNANT HOUSEHOLDER.

PAPERHANGING.

A CORRESPONDENT, signing himself "An old D-Trap," writes:—As a paperhanger, although not the regular paperhanger, will you, through your many artistic correspondents, obtain for me some information about "Drop blocks," so wasteful, so very perplexing, and, shall I say, so outrageous; and it seems not to be confined to our own, but to French goods as well. How can it be prevented?

Another correspondent to whom the above was shown sends the following reply:—

Sir,—To make a design "drop" in the hanging is an expedient resorted to by most artists of experience to give greater interest to their designs, and to avoid the monotony of a constant repetition of the same form in unbroken lines all round a room. It has no influence whatever in causing waste; indeed, I am assured by a master paper-stainer of great experience, it most frequently is an aid to economy in quantity. The following instance is a case in point:—Assume that a room, 10 ft. 10 in. high, is to be covered with a design, 21 in. by 21 in. If it joins straight across, seven repetitions of the pattern must be cut to make one breadth, seven times 21 = 12 ft. 3 in., therefore the waste in every breadth is 17 in. If it "drops," 6½ prints (repetition) will be ample, the half print left at bottom of first breadth forming the top of the

second, and so on, the waste being thus reduced to only 6 in. in each breadth.

There can, of course, be no arbitrary rule, rooms being of all heights, and designs of all dimensions, the example taken being the standard size for good patterns. Any one who will work the simple problem for himself with designs of other sizes will find very similar results.

If the first breadth of a drop pattern fits the wall without any waste, "the regular paper-hanger" cuts half a print off the top of every second piece, not breadth, and that is all the waste involved, which is practically very little.

The idea that waste is occasioned by a "drop" pattern being a very prevalent misconception, I am pleased to have the opportunity to assist in removing it. GEO. C. HAITE.

SMOKY SMELLS.

SIR,—In reply to R. K. Hervey's letter [p. 559], we may say that a similar job to that mentioned by your correspondent came under our notice about four months' back. On examination we found the joints to the 4½-in. brickwork forming the front of the flue very defective, and made worse by the carpenter driving a plug wherewith to fix the skirting-grounds when the work was green. We would recommend your correspondent to have the skirting and grounds taken down to the side wall containing the flues, also the flooring adjoining; cut the joist out should it run lengthways and close to the wall. Then carefully connect the plastering of the lower room to that of the upper. Take out the stove and mantle, render the wall at the back of the same, and as high up the flue as a man can reach; replace all disturbed, and his trouble (minus the builder's bill) will be at an end. WILKES BROS.

THE GALE OF THE 14TH ULT.

SIR,—The paragraph in your last issue [p. 557] does not show the full gravity of this storm in relation to dangerous structures and loss of life. When a building, chimney, or wall is blown down, it very possibly ceases to be dangerous, and so fails to receive notice in that sense. In my district, the heavy parapets of four houses were blown over into the forecourts; a garden-wall was blown over, with the loss of one, if not two, lives; and several chimney-stacks were thrown down, breaking through more or less into the bedrooms. In one case, the slates were blown from a large roof, and, for the time, had possession of the street and adjoining gardens for a length of 100 yards. Yet I have only had to report upon three dangerous structures arising out of these matters, and, at this rate, the number of 100 reported at the Board of Works would represent several hundreds of accidents more or less dangerous to life.

The lesson we learn from these events is that much greater care is required in executing brickwork, slating, &c., in exposed situations, as well as care with respect to buildings that show signs of insecurity; for there is little doubt that, should a similar gale spring up from the opposite quarter, we should have a similar list of casualties to that now in question.

THOS. BLASHILL,
District Surveyor, Bethnal-green East and South Bow.

HOT-WATER PIPES IN LIBRARIES.

SIR,—I should feel obliged for an opinion from those who have had experience in the heating, by the hot-water system, of public and other libraries, whether any and what objection has been found to arise from the heat given off by pipes running round the room, close to the lower shelves containing books? And what effect has this system on the air of a room where the supply is given by windows and doors only? Would it not be better to place the hot-water pipes in the form of coils in the centre of the rooms, so that the binding of the books would not be affected by nearly immediate contact with heated pipes? H. W. P.

BROMLEY SEWERS.

SIR,—At page 558 of the *Builder* of the 29th of October, you state that serious charges are made against me to the effect that certificates have been given and moneys paid for work not done to a large amount. I deny having done anything of the kind. A list of that portion of the sewers executed under my supervision is in the hands of the Bromley Local Board; and I court the fullest inquiry as to their value. May I ask you to insert this in your next? JOHN GARTON.

ACCIDENTS FROM LIGHTNING IN GERMANY.

A TREATISE recently published in Germany by Dr. Holtz, of Greifswald, deals with the question of the progressive increase of cases in which buildings are struck by lightning.

The general results of Dr. Holtz's investigations are thus summed up by the *Rheinische Courier*:—

1. There has not been an increase of storms, nor is such to be apprehended in the future.

2. The increased danger from lightning arises from various causes, such as the continued destruction of woods and trees in the vicinity of inhabited districts. Formerly the numerous tops of trees, &c., served to divide the electricity. Another reason is the increased use of dangerous appliances in and about buildings.

3. These causes being strictly telluric and not atmospheric, and being constantly extending the sphere of their action, a proportionate increase of danger from lightning is to be expected in the future.

4. It is therefore necessary for the use of lightning conductors to be extended, and for the planting of trees to be encouraged. The use of dangerous appliances should also be, as far as possible, diminished, and the destruction of woods be restricted in some way.

The technical press of Germany has given currency to the opinions of Dr. Holtz, which open an interesting field for discussion on a matter of general importance.

TESTING TRAPS.

SIR,—Replying to your correspondent, Mr. Rankin [p. 560], I must in the first place remind him that during the whole of Mr. Hellyer's lectures no mention whatever was made of the momentum of the water in traps. The greater part of the experiments were arranged with a view of testing siphonic action. These two principles are governed by two distinct laws, and have no action in common. It must be remembered also that the experiments placed before the audience at these lectures were not so fixed as to display to those present the momentum of the water, or, in other words, make itself evident, neither was it anticipated.

With regard to the remark that I am eating my own words, I regret to say that there is some truth in it. I judged the "Eclipse" trap theoretically, but having some doubts about it applied the practical test. I must, therefore, apologise to my readers for having (though only slightly) misled them, and as Mr. R. doubts the truth of my assertions as to the action of this trap, he should have availed himself of the opportunity offered to test them for himself. I now repeat my assertion that on this point the action of the "Eclipse" trap is the same as the *D*, as on reading Mr. Rankin's letter I again put the traps to the test on last Saturday afternoon, in presence of Mr. G. Davis (foreman to Mr. G. Jennings), Mr. J. Harsant, Mr. R. Panario, and several other soundly practical men of the trade.

As I have not seen the letters of Mr. J. Smeaton and Mr. D. Emptage, I cannot reply to them in detail, but think it probable that this will reply to the whole.

P. J. DAVIES.

ENGINEER AND CONTRACTOR.

SIR,—In your issue of the 22nd October, we observe an instance of one and the same gentleman figuring concurrently as Engineer to the Sewerage Scheme of a Somersetshire town, and as the successful competing contractor for a small road and sewer-making job in the neighbourhood of London.

Doubtless the Somerset Local Board is in happy ignorance of the Admirable Crichton-like qualities of its adviser, while on the other hand the directors of the Land Company that wants its road made, may, with readier means of information around them, be congratulating themselves on having met with a real live civil engineer of modesty sufficient to take work from them as a mere contractor.

And yet we, sir, as contractors,—pure, if not simple,—are dissatisfied with such a state of affairs, and address you to draw attention to the anomaly. We should like to have been among the competitors for the works of the Somersetshire town; but we cannot with justice to ourselves submit a tender to the judicial scrutiny of a gentleman who to-morrow may be in competition against us.

CONTRACTORS.

AN EAST END BRIDGE.

IF a bridge were built over the Thames where it is half a mile wide a rise of 1 in 20 would make the centre arch 66 ft. higher than the carriage way at the foot of the bridge. This added to the height at the foot of the bridge above the water level would make up enough height for ships to sail under the centre arch. Such a bridge might be built from Tilbury to Gravesend, and establish the much-needed communication between Essex and Kent. Where the river is only 1,320 ft. wide, the approach on each side might begin 660 ft. inland on each side, so as to gain the same rise. This could be done a very short distance below London Bridge.

A third alternative, which could be carried out anywhere, would be to build a diagonal bridge intersecting the river at such an angle as would give the rise required. Such, as for example, from Tower Hill to Rotherhithe.

W. SCARGILL.

The Padiham Local Board have decided to apply to Parliament for power to construct a new reservoir at Churn Clough, to hold 100,000,000 gallons, at a cost of 40,000*l*.

PROVINCIAL NEWS.

Hereford.—The 500th anniversary of Hereford Cathedral school has been celebrated by commencing the erection of a school-library in memory of the founder, Bishop Gilbert. In addition to the library two new class-rooms are being added, and arrangements are being made for isolating boys in case of illness. The works are being carried out from designs of Mr. Kempson, architect, and the contractor engaged is Mr. Cullis, of Hereford.——Three richly-carved Glastonbury chairs, designed by Mr. Kempson, have been presented to the chapel at the Hereford County College, by the Dean of Hereford. The carved work has been executed by Mr. Robert Clarke.

Lincoln.—The new road,—henceforth to be known as Yarborough-road,—on the west side of the city, connecting the West Parade (late Brick-yard-lane) with the Burton-road, was opened on the 19th ult. Hitherto, the only available route into the lower part of the city from the north-west district, at least for heavy traffic, has been *vid* Rasen-lane, Church-lane, Minster-yard, Pottergate, New-road, and Silver-street, the Asylum-road being far too steep to be of much service for vehicular traffic. The new road is about 1,300 yards in length, and 40 ft. wide throughout. The steepest gradient is one in sixteen, the average being one in twenty-three. The work has been carried out under the direction of the City Surveyor, Mr. J. J. Henderson.

Liverpool.—At the meeting of the Health Committee of the Corporation of Liverpool, on the 20th ult., Mr. J. Barkeley Smith, the deputy-chairman, made a few remarks on the amount of work done by the committee during the year. The engineer informed him that in his department twelve miles and a half of tramways, including reconstruction and extensions, had been executed; 19,000 square yards of impervious paving had been laid on carriageways outside the tramway limits and in other streets throughout the city. The expenditure on paving works and tramways, &c., amounted to 200,000*l*. In the sewage department four miles of sewers were repaired, four miles of new sewers constructed, twenty-three miles of sewers ventilated, 500 ventilators fixed and manholes brought to the surfaces, 18 miles of public sewers cleansed, 1,325 loads of deposit removed, and 66 miles of public sewers flushed. The total expenditure in the sewerage department was 35,000*l*. The sewerage inspectors visited 10,000 places where complaints were made of defective drainage. The work of the building surveyor's department included the erection of 1,795 houses, 325 alterations of houses, 31 warehouses erected, and 164 workshops erected. In regard to 2,516 dangerous buildings, notices were served, besides 2,000 miscellaneous notices. The committee had every reason to be satisfied with the way in which the engineer's work was done. He was glad to find that their exertions to reduce the death-rate in the city had met with success. The death-rate during the year had been 26·2 per 1,000. The death-rate for the previous five years,—1876 to 1880,—was 27·5 per 1,000, and that for the five years from 1871 to 1876 was 29·5 per 1,000.

Hanley.—Mr. Harrison, C.E., from the Local Government Board, attended at the Town Hall on the 21st ult. to hold an inquiry in reference to an application of the Corporation to borrow 3,000*l*. for paving roads, 2,000*l*. for street improvements, and 600*l*. for a steam roller. The inspector reduced the item for a steam roller to 450*l*.

Great Yarmouth.—The Lands Committee of the Corporation of Great Yarmouth have resolved to subscribe 30,000*l*. towards the proposed docks near the entrance to the harbour. The area will be about ten acres and a half, and the cost, exclusive of land compensation, sidings, and warehouses, 70,000*l*. The docks will be 1,100 ft. long, and 400 ft. wide, with a depth at high water of 24 ft., and 18 ft. at low water. The length of quayage will be about 4,000 ft.

Wolverhampton.—Important alterations in the sanitary arrangements of the Wolverhampton and South Staffordshire General Hospital have just been completed. The hospital has been extended at various times, but these additions, it is said, intensified the sanitary defects of the building. Thus, the main drain was carried below the floor of the building, and beneath the out-patients' wing and the new laundry was an old culvert which carried the sewage into the town drains. These have all been taken up, and a new system of drains has been laid down, which are quite clear of all the

buildings. All the soil and waste pipes, as also the rain-water down-pipes, have been removed from inside, brought down outside, and ventilated, the whole of the waste-pipes being disconnected from the drains by open traps, and the soil-pipes carried above the roof. The whole of the work has been carried out from the plans and under the direct superintendence of Mr. Geo. Hurst Stanger, C.E., the engineer to the Wolverhampton Sanitary Protection Association. The contract for the drainage has been carried out by Messrs. Horsman & Co., of Wolverhampton; and the contracts for the plumbing have been executed by Mr. E. Jones and Mr. J. Atherton, of Wolverhampton.

CHURCH-BUILDING NEWS.

Lockwood, Huddersfield.—Emmanuel Church has just undergone considerable improvements, including the erection of a carved memorial oak pulpit, in the Decorated style, with the top of open tracery work, filled in with brass grilles. An ornamental reredos is also among the work, which has been executed by Messrs. Jones & Willis.

Colchester.—The repair of the Church of St. Martin, Colchester, is now about to be commenced. This beautiful and interesting church has in the course of years been reduced to a state bordering on ruin. It was inspected by the members of the Royal Archæological Institute on the occasion of their visit to Colchester in 1878, and, at the suggestion of the late Sir G. G. Scott, the chancel ceiling was stripped and the fine fourteenth-century roof exposed to view. The present repairs are confined, for lack of funds, to the work most urgently required to preserve the fabric from the effects of the weather, and include the removal of ceilings and the opening and repair of roofs. The works are under the direction of Mr. E. J. Dampier, of Colchester, the contract being taken by Messrs. Gardner & Son, of Coggeshall.

Cannock.—On the 21st ult. the memorial-stone of the new parish Church, Cannock, now being rebuilt, was laid. The contract for the work has been taken by Mr. Thomas Williams, of London, for 2,430*l.* and he is carrying out the work under the superintendence of the architect, Mr. Nicholas Joyce, of Stafford. The church, dedicated to St. Luke, is of ancient date. It consists of a nave, with north and south aisles, chancel, and western tower. The nave appears to have undergone considerable alteration at the time the south aisle was built in 1753. A great part of the north aisle was rebuilt in 1849. The chancel was the oldest part of the church, in the style of the first half of the fourteenth century, but this had been altered considerably since its erection. Evidence of its having had three different roofs is found by grooves on the east wall of the nave. The last was a modern hipped roof, by which the building was much disfigured. In order to effect the desired enlargement of the church, the entire removal of the chancel was unfortunately inevitable. This will be re-built further eastward, and the style of architecture of the old chancel has dictated the character of the whole of the new work. Two new bays, each about 15 ft. wide, will be added to the length of the old nave and aisles, affording additional accommodation for 240 persons. The western tower will remain as at present, except that the parapet will be repaired and the old angle pinnacles, which are now wanting, will be replaced.

St. Ewe, Cornwall.—The parish church has been recently re-opened after renovation. The architect was Mr. James Piers St. Aubyn, of London. The building exhibits many interesting features, and, unlike West-Country churches generally, has a western spire. The old wagon-headed carved oak roof of the south aisle, and those in the north transept and porch, have been restored; whilst the chancel, nave, and south aisle, have been newly covered. Most of the windows are new, and are in "Wild Duck" stone. Encaustic tiles line the avenues and the chancel floor. There is a new parclose-screen, and the church is seated generally by open benches. The windows are filled with stained glass, by Messrs. Heaton, Butler, & Bayne, of London, and Messrs. Fouracre & Watson, of Plymouth. The chief feature of archæological interest in the building is the exceptionably fine old Perpendicular rood-screen. This is of carved oak, groined on both sides, and full of much handsome detail. Screens of this sort, although common in several of the western counties, are rare in Cornwall. The screen has been underpinned, and a new sill put in; it has been lengthened a bay at each end. Mr. Harry Hems, of Exeter, was entrusted with this work. The general contract, amounting to 2,500*l.*, has been carried out by Mr. William May, builder, of Pool, near Camborne.

STAINED GLASS.

Warminster.—A stained-glass window has been placed in the Chapel of St. Boniface, Warminster. The subject represented is the "Crucifixion," with the figures of St. John and the Virgin Mary at either side. The window is from the studio of Mr. Charles Evans, of Fleet-street, London.

Mitcham.—A painted window has lately been erected in the north aisle of Christ Church, Mitcham, to the memory of Mrs. Ann Nobes. The subject is "Charity distributing her Gifts to the Poor," and underneath it is the appropriate text, "I was an hungered, and ye gave me meat." An ornamental canopy and base are introduced. The window, has been designed and executed by Mr. Charles Evans.

Brighton.—On the 7th ult. a five-light window was placed in the chancel of All Saints' Church. The centre light contains the figure of our Saviour. On each side are figures of the evangelists. The tracery is filled with foliage work, and emblems of our Lord's Passion. The window was the gift of members of the congregation. In the south aisle of the same church is a three-light window, and tracery containing the subject of "Christ healing the Sick." The window is the gift of the curate, the Rev. F. L. Meares. Both windows were designed and executed by Mr. Geo. Rees, Lamb's Conduit-street.

St. Leonard's-on-Sea.—The large east window of St. John's Church has recently been filled with stained glass. The subject represented is the Crucifixion, with the Magdalene kneeling at the foot of the Cross; while on either side are standing figures of St. John and the Virgin Mary, and the two pillars of the church, St. Peter and St. Paul, as expounders of Christ's teaching. Under each of the lights are subjects relative to the life of St. John. There are angels at the top of each light looking towards the figure on the cross. The window was designed and executed by Messrs. Heaton, Butler, & Bayne, of London.

Combmartin (North Devon).—A memorial window has just been placed by Mr. James Staples at the east end of the chancel aisle of the parish church. It is a lofty window, with four lights. In the tracery are the figures of the four great prophets, and above them two angels. In the two middle lights are represented the Ascension of our Lord and the Last Supper; in the left-hand light the Call of St. Peter from his Boat and Nets; and under this, his Receiving the Keys. In the right-hand light is represented the Descent of the Holy Spirit on the Day of Pentecost, and below this St. Peter preaching. The window is the design and work of Messrs. Lavers, Barraud, & Westlake.

Books.

The Book of Scales. By Ambrose Wheeler Holohan. London: Longmans, Green, & Co. 1881.

This book is principally designed for the use of students preparing for entrance into the Royal Military Academies at Sandhurst and Woolwich, but will be found of service by architects' and engineers' assistants also. It gives a larger number of examples, and is more illustrative, than any previous treatise on the subject that we remember.

VARIORUM.

We have before now spoken of the usefulness of Dr. Wershoven's "Technical Vocabulary, English and German." The same publishers, Hachette & Co. (King William-street), have now issued a similar little volume in English and French,—"Technical Vocabulary, English-French, for Scientific, Technical, and Industrial Students." This will be found useful in technical schools, and by many persons besides. It is divided into subjects; and a French index and an English index at the end increase its availability.——"The A B C of Gothic Architecture," by John Henry Parker, C.B. (Parker & Co.), is intended as an introduction to the author's well-known larger works on the same subject. It is written simply, very fully illustrated, and should get into schools. We quite agree with the author that knowledge of this kind acquired in early days will be found useful in after-life, and is seldom forgotten.——"Luxury, Ancient and Modern," in the current number of the *Quarterly*, is a most agreeable piece of reading. The writer ends by boldly declaring "that we are better than our forefathers." A much worse case against the present time, however, could be made out than he presents.——In the new number of the *Nineteenth Century* the Rev. Canon Venables re-urges his opinion that the style of the new cathedral for Liverpool should be Classical, not Gothic, and that Sir Christopher Wren's original design for St. Paul's, with certain modifications, should be adopted. A poem by Mr. Tennyson in this number of the Review will probably take it through two or three editions.——*Knowledge* is the title of an illustrated magazine of science, edited by Mr. Richard A. Proctor, of which the first number is published. It is intended to bring the truths, discoveries, and inventions of science before the public in simple but correct terms,—to be, in fact, the minister and interpreter of science for those who have not time to master technicalities (whether of science generally or of special departments), and will cost but 2d. Messrs. Wyman are the publishers. It ought to succeed.

Miscellanea.

The Tunnel under the Severn.—The Great Western Company's tunnel, four miles and a half long, under the Severn,—which is to be the new highway of traffic from South and Mid-Wales,—is progressing more satisfactorily than at any previous period. The streams of water which flooded the heading, and suspended operations there for a time, have been confined to manageable limits, and the difficulty of ventilation is also overcome. The working of the exhaust-system is so successful that at nearly a mile from the mouth of the shaft the air is fresh and agreeable, and blasting can be done without any danger to the workmen. The engineer anticipates that the tunnel will be completed within five years. It is stated that a good many geological secrets have been discovered while the work goes forward, and among them this, that a spring cut in driving the heading,—full 40 ft. below the Severn,—drew its waters from strata containing very large deposits of salt.

Stonehaven (N.B.).—St. John's Chapel has been re-opened, after alterations. The building was erected in 1859, and was the gift of the late Mr. John Beattie, Stonehaven. The alterations have added considerably to the sitting accommodation in the church. The work has been carried out from the designs and under the personal supervision of Mr. John Watt, Fetteresso, and the contractors for the work were:—Messrs. Gregory, mason; James Murray, jun., carpenter; James Burness, plumber; George Valentine, slater; Alexander Cormack, plasterer; and G. R. Taylor, painter and glazier.

The Whitmore Memorial, Bridgnorth, has been unveiled. It consists of a fountain, surmounted by the figure of Sabrina (goddess of the Severn), in bronze. There is a bronze medallion of the late Mr. Henry Whitmore, who was member for Bridgnorth in five Parliaments, Lord of the Treasury, and Keeper of the Privy Purse to the Prince of Wales. The Whitmore family were proprietors of Apley, and the greater portion of Bridgnorth, for many centuries.

Messrs. Unwin's Premises, Blackfriars. In the account which we gave of these new buildings on the 1st ult., we spoke of the very good basement which they contain. We may add that this is exceedingly well lighted by the use of Messrs. Hayward Bros. & Eckstein's pavement lights, which have given perfect satisfaction to the owners.

Royal Institute of British Architects.—The opening meeting of this Institute for session 1881-82 takes place on Monday evening next, the 7th inst., when the president, Mr. Street, R.A., will deliver an inaugural address.

Newton, Chambers, & Co. (Limited).—The Directors give notice that no further application for shares in the new company will be received after Thursday next, the 10th inst.

West-street Wesleyan Schools, Leek.—Extensive alterations and improvements have been made in these premises. In the large room on the first floor, for instance, used for public purposes, an orchestra, of amphitheatrical form, has been introduced, giving accommodation for a large chorus, and at the opposite end a gallery supported on pillars has been erected, increasing the seating capacity of the room. The old low flat ceiling has been taken out, and the roof timbers wrought to show themselves constructively. There are now in all twenty-six class-rooms for separate teachers, as against ten on the former arrangement. The larger ones are about 24 ft. by 20 ft., and the rest about 15 ft. by 13 ft. This increase will relieve the large room of the class-teaching on Sundays; and it will be used on that day for the general assemblages of the scholars. The works have been carried out to the plans and under the superintendence of Messrs. William Sugden & Sons, architects, Leek. The contractor was Mr. T. S. Bromage; and the painting and plumbing have been done by Mr. H. Stevenson. Mr. Mark Sutcliffe has fitted up the hot-water system; and Messrs. Gent, the electric bells.

Iron under Fire.—The London Stereoscopic and Photographic Company have published three excellent photographs of Messrs. Foster & Co.'s premises in Cheapside, burnt out in September last, and which serve to show the remarkable way in which the ironwork resisted the fire on that occasion. The fire at these premises, it will be remembered, was of a very extensive nature, and the contents of the building were of a very inflammable description. The columns, moreover, were all fully exposed to the action of the fire, as they had no coating (except the paint). The construction adopted by the architects, Messrs. Ford & Hesketh, appears not only to have thoroughly tied the walls together, but probably was the means of preventing the entire collapse of the building during the progress of the fire. The architects might usefully give a full account of the work. The ironwork was supplied by Messrs. Measures, Bros., & Co., of Southwark-street.

Native Guano Company's Show at Aylesbury.—On Wednesday last week this Company held their first show of farm and garden produce at their Sewage Works at Aylesbury, when a company of gentlemen assembled to witness not only the system pursued by the Company in dealing with the raw sewage of the town of Aylesbury, but the products derived from the use of their manufactured native guano. The visitors were struck by the extraordinary size and quality of the productions. The total number of specimens on view was 6,777. The mangels were of excellent quality, as were also the swedes, and called forth keen competition between the farmers of the Vale of Aylesbury. At a luncheon, given in a marquee on the ground, several practical farmers bore testimony to the high fertilising character of the Native Guano Company's manure.

Large Map of France.—The French War Office is preparing an elaborate map of France, on a scale nearly twice as large as that of the Staff map at present in use in the army, the result of a survey specially made by military officers. The sheets, some of which are already completed, are to be engraved by the zinc process. By the use of a great variety of colours much practical information will be afforded, such, for instance, as the condition and elevation of the roads, while even the existence of meadows and vineyards will be noted for the first time.

The Roman Villa at Wingham.—In the Roman villa discovered at Wingham by Mr. George Dowker, the portions brought to light recently are worth inspection. Two of the rooms have ornamented tesselated pavements, and a third, which appears to have been a bath, is decorated also upon the walls with tesselated work in black and white, of which it would be difficult in this country to point to another example. Wingham is only about two miles from the Adisham-road Station on the London, Chatham, and Dover Railway.

Bequest.—The late Mr. William Ward (who died on the 26th of October) has bequeathed the sum of 100*l.* as a legacy to the Builders' Clerks' Benevolent Institution. Mr. Ward was the uncle of Mr. Thomas Peto Ward, the founder of this excellent charity, and the above bequest is the first that has been made to its funds.

Rettie's Patent Scaffold Fastener appears to be getting into use, and, as it seems to us, deserves to do so. It is simple and durable, and saves labour.

Cheadle.—Certain alterations are in progress at the Primitive Methodist Chapel, Cheadle. The chapel will be re-seated in varnished woodwork, and a panelled wall dado will be formed out of the old seat-framing, and painted a dull green. A double vestibule entrance is being built at the front, carried up one story only, and finished with an inscribed pediment and balustrade; above which the main wall (with three-light window) sets back. Internally, the present flat plastered ceiling is stripped off and the timbers of the roof encased with reed boarding, considerably increasing the cubical content. The addition of a small porch at the back will protect the entrances to schoolroom and chapel at this end from cold draughts. The schoolroom on side of chapel is divided from it by a balustraded arcade with sliding shutters, as it is intended to form part of the chapel at large gatherings. The total cost will be about 500*l.* The builders whose tenders have been accepted are Messrs. Samuel Waugh, William Ball, and William Shufflebotham, all of Cheadle. Messrs. William Sugden & Son, of Leek, are the architects.

Builders' Benevolent Institution.—The offer of a hundred guineas, made by an old friend of this Institution, if twenty other friends would give ten guineas each, has been nobly responded to, *three times* that number having sent in their names. The annual dinner took place on Thursday, the 3rd of November, Mr. George Burt, J.P., in the chair. The total amount of the subscriptions and donations announced during the evening was 1,436*l.* 7*s.* 6*d.*, including the hundred guineas referred to and one hundred guineas given by the Chairman. We reserve our report for next week.

Hereford Surveyorship.—Mr. Kenworthy, mentioned in our last as one of the selected, wishes it to be stated that upon ascertaining that private practice was not allowed, he immediately withdrew his name from the election and did not attend the meeting.

The Artisans' and Labourers' General Dwellings Company have purchased a new estate of about ninety-eight acres at Hornsey. The directors are now considering plans for the development of the estate.

TENDERS

For cast-iron, earthenware and brick sewers, and other works at the Sutton Coldfield Sewerage Works. Mr. E. Pritchard, engineer. Quantities by Mr. E. J. Parnell.

Contract No. 1.

Wilkes & Co., Bishopsgate, E.C.	£28,653	0	0
Bottoms Bros., Battersea	21,500	0	0
W. Scott, Newcastle-on-Tyne	20,472	0	0
G. Hunter, London	17,590	8	2
McKenzie, Williams, & Co., Moorgate-street, E.C.	17,053	0	0
Nelson & Co., York	16,289	0	0
Ford & Everett, Westminster	15,950	0	0
W. J. Botterill, London, E.C.	15,624	0	0
W. Lean, Gloucester	15,283	0	0
T. Kirk, Chester	14,700	0	0
Hill Bros., Beckenham, S.E.	13,991	0	0
W. Holland, Leicester	13,900	0	0
J. W. Pickthall, Bromsgrove	13,699	0	0
J. Evans, Walsall	13,000	0	0
Currall & Lewis, Birmingham	12,989	0	0
Hilton, H., Birmingham	12,983	0	0
G. Law, Kidderminster	12,577	0	0
J. M. Smith, Westminster	12,550	0	0
A. Palmer, Birmingham	11,990	0	0
J. Fell, Leamington (accepted)	11,984	0	0
Engineer's estimate	13,896	5	6

For cast-iron pipes and special castings.—Contract No. 2.

T. Piggott, & Co., Birmingham	£1,085	0	0
Cochrane & Co., Dudley	1,008	0	0
Butterley & Co., Westminster	957	0	0
Staunton Iron Co., near Nottingham	944	11	0
C. E. Firmstone, & Bros., Stourbridge	831	0	0
J. & S. Roberts, West Bromwich*	829	0	0

* Accepted.

For alterations and additions to premises in King Henry's-walk, Balls-pond. Messrs. Anderson & Doubleday, and Mr. John Johnson, joint architects. Quantities supplied by Messrs. Maughan & Curson:—

Clarke & Bracey	£1,133	0	0
Clemence	1,080	0	0
Lawrance	1,070	0	0
Falkner	1,066	0	0
Boyce	1,044	0	0
Macey & Sons	1,027	0	0
Conder	997	0	0

Accepted for the erection of a new chapel at Smyllum Orphanage, Lanark. Messrs. Pugin & Pugin, architects. Quantities by Mr. R. J. Harris:—

Excavator, Mason, and Bricklayer.

Ebenezer McMorran, Carstairs Junction	£954	0	0

Carpenter, Joiner, and Ironmonger.

John Baxter, Glasgow	£939	9	11

Slater and Plasterer.

Thomas Glaister, Lanark	£239	4	7

Plumber, Painter, and Glazier.

Proctor & Son, Biggar	£145	0	0

For extension and additions to the Army and Navy Stores, Westminster. Mr. James Knowles, architect. Quantities by Messrs. J. & A. Bull:—

				Months.
McManus	£27,950	0	0!	12
Nightingale	26,916	0	0	9
Burmish & Foster	26,360	0	0	20
Kirk & Randall	24,935	0	0	10
Oldrey	24,933	0	0	16
Perry & Co.	24,105	0	0	9
Killby	23,905	0	0	8
J. H. Brass	23,820	0	0	11
Bangs & Co.	23,815	0	0	10
Langmead & Way	23,780	0	0	12
Williamson	23,679	0	0	9
Morter	23,515	0	0	8
Hook	23,450	0	0	9
Brass	23,391	0	0	8½
Beale	23,353	0	0	8
Higgs & Hill	22,940	0	0	8½
Lawrance	22,772	0	0	9
Clark	22,470	0	0	—
Mowlem & Co.	21,940	0	0	18
Stephens & Bastow	21,000	0	0	15
Shaw	20,255	0	0	12
Martin, Wells, & Co.	20,000	0	0	6
Patman & Fotheringham	19,773	0	0	8
J. O. Richardson	18,938	0	0!	12

For new schools at Heber-road, East Dulwich, for the School Board for London. Mr. R. R. Robson, architect. Quantities by Mr. Ch. W. Brooks:—

T. G. Wood	£11,775	0	0
W. Brass	11,664	0	0
Higgs & Hill	11,490	0	0
Perry & Co.	11,096	0	0
C. Wall	11,026	0	0
J. T. Chappell	11,012	0	0
J. D. Hobson	10,948	0	0
Stimpson & Co.	10,926	0	0
W. Shepherd	10,841	0	0
B. R. Nightingale	10,781	0	0
W. Downs	10,742	0	0
W. Oldrey	10,679	0	0
W. Tongue	10,619	0	0

For new schools at Homerton-row, Hackney, for the School Board for London. Mr. R. R. Robson, architect Quantities by Mr. T. Thornton Green:—

W. Brass	£13,474	0	0
Higgs & Hill	13,346	0	0
T. G. Wood	13,114	0	0
W. Oldrey	12,594	0	0
G. S. Pritchard	12,568	0	0
E. Lawrence	12,562	0	0
G. S. Williams	12,412	0	0
J. Grover	12,176	0	0
C. Wall	11,401	0	0

For the supply of materials, and the execution of the general works in "District B" of the Metropolis, for periods of one, two, or three years, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

		Above Schedule Prices.	Below Schedule Prices.
Williams, Son, & Wallington	1 year,	7%	—
	Ditto 2 years	6%	—
	Ditto 3 ,,	4%	—
Martin, Wells, & Co.	1 year	5%	—
	Ditto 2 years	2½%	—
	Ditto 3 ,,	— (at schedule prices)	—
Ford & Everett	1 year	—	5%
	Ditto 2 years	—	5%
	Ditto 3 ,,	—	5%
George Butler*	1 year	—	7½%
	Ditto 2 years	—	7½%
	Ditto 3 ,,	—	7½%

* Accepted for one year at 7½ per cent. under schedule prices, and promised to be continued for two years further if first year's work is satisfactorily performed.

For alterations and additions to Durham House, Southfields, Wandsworth, for Mr. Frederick Stroud. Messrs. Humphries & Co., architects:—

Adamson & Sons	£790	0	0
Henry Scott	776	15	0
Turtle & Appleton	653	0	0
James Poise	640	0	0
J. Sutton (accepted)	560	0	0

For three shops and dwelling-houses in Catherine-street, Salisbury, for Mr. James Lywood and Mr. John Walker. Mr. Fred. Bath, architect. Quantities supplied:—

John Wort, Salisbury	£3,844	2	6
Philip Tryhorn, Salisbury	3,365	0	0
Dolman & Harris, Salisbury	3,195	13	8
Young & Sons, Salisbury	3,035	0	0
Edward Abley, Salisbury (accepted)	2,960	10	0

For corn warehouse, stables, and outbuildings, Spa-road, Bolton, for Messrs. R. Byers & Sons. Quantities supplied. Mr. T. Ormrod, architect:—

Excavation, Brickwork, and Masonry.

Contract A.

Brown	£834	0	0
Smithies	822	0	0
Fletcher	788	0	0
Bradbury	787	0	0
Merrick (accepted)	770	0	0

Joiners, Slaters, Plumbers, Glaziers, and Painters' Work.

Contract B.

Roberts	£651	5	0
Skinner	550	16	0
Townson	550	15	0
Burrows & Son	539	0	0
T. W. Taylor	530	0	0
W. & L. Marsh (accepted)	502	10	0

Ironwork to Warehouse, Floors and Roofs, and Concrete Floors.

Contract C.

Swarbrick & Co.	£1,664	19	0
Homan & Rodgers (partly accepted)	937	0	0

Note.—Excavation and Basement to Warehouse.—Separate Contract under Schedule.

W. Aspinall	£256	0	0

For building "Emanuel Schools," Forest-gate. Messrs. Habershon & Fawckner, architects. Quantities by the architects:—

Cass	£1,654	0	0
Allen & Son	1,630	0	0
Beale	1,592	0	0
Staines & Son	1,572	0	0
Gregar	1,540	0	0
Balsam Bros.	1,540	0	0
Garrud	1,483	0	0
Castle	1,480	0	0
Priestly	1,469	0	0
Battley	1,459	0	0
Johnson	1,447	0	0
Hooper	1,435	0	0
Johnson	1,429	0	0
Warr	1,427	0	0
Pack Bros.	1,420	0	0
Maton	1,395	0	0
Jones	1,385	0	0
Crisp & Tomlin	1,383	0	0
Richardson	1,369	0	0
Evans	1,359	0	0
Higgs	1,338	0	0
A. S. Judd	1,330	0	0

For the first and second sections of the restoration of St. Martin's Church, Colchester. Mr. E. J. Dampier, architect:—

Oldridge	£776	0	0
Dobson	740	0	0
Dupont	695	0	0
Gardner & Son (accepted)	651	7	0

For alterations to the "Gregorian Arms," Jamaica-road, Bermondsey, for Mr. Meacock. Messrs. Muggeridge & Powell, architects:—

Fisher	£322	10	0
Whitby	250	0	0
Riddell (accepted)	192	0	0

For new offices on forecourt of No. 200, Kennington-park-road, for Messrs. Briant & Son. Messrs. Muggeridge & Powell, architects:—

Riddell	£435	0	0
Fisher	397	0	0
Burman	319	0	0
Taylor	387	0	0

For enlargement of St. Andrew's Schools, Westbourne-park. Edward Vigers, architect:—

Temple & Foster	£398	0	0
Thomas & Butland	375	0	0
W. Oldrey	371	0	0
Lamble	359	18	0

For new chancel and organ chamber to St. Mary's Church, Balham, for the Rev. Thomas Bates and committee. Mr. Arthur Cawston, architect:—

Downs	£1,417	0	0
Higgs & Hill	1,320	0	0
Adamson	1,216	0	0
Bowyer Bros.	1,194	0	0

For alteration and additions to 53, High-street, Bromley, necessary for turning same into coffee-house and public baths, for Mr. S. Cawston. Mr. Arthur Cawston, architect:—

Crossley, Bromley (accepted)	£902	0	0

For new coffee-house and public baths, Shortlands, for Mr. S. Cawston. Mr. Arthur Cawston, architect:—

Inge, Shortlands	£618	0	0
Bowyer Bros., Upper Norwood	595	0	0
Soans, Shortlands	575	18	0
Garrett, Clapham	575	0	0
Crossley, Bromley (accepted)	540	0	0
" " additional buildings to same, 223*l.*, total	763	0	0

For additions to residence, 52, Circus-road, St. John's-wood, for Mr. H. S. Leon. Mr. Arthur Cawston, architect:—

C. Tavener & Son, St. John's-wood*	£1,365	0	0

* Accepted.

For additions to "The Temple," Oatlands-park, for W. Hewett. Also new stabling and entrance lodge. Mr. Arthur Cawston, architect:—

	House.			Stables, &c.		
Bowyer Bros., Norwood	£2,767	0	0	£1,182	0	0
Ingram, Hersham	2,690	0	0	1,090	0	0
Lynde, London	2,632	0	0	1,144	0	0
Knight, Chertsey	2,640	0	0	1,095	0	0
Brown, Oatlands	2,650	0	0	1,020	0	0
Batchelor, Leatherhead	2,530	0	0	999	0	0
Messom, Twickenham	2,393	0	0	993	0	0

For house on the beach, Weston-super-Mare, for Mr. E. T. Dew. Messrs. Hans Price & Wooler, architects:—

W. Crocker	£3,581	0	0
Jesse Shorney	3,300	0	0
Robert Shorney	3,175	14	0
A. J. Beavan	2,985	0	0
R. Lewis	2,899	10	0
S. T. Starrey & Co.	2,675	0	0
George Steere	2,175	0	0
J. Vowles (accepted)	1,994	0	0
G. H. Pocock	1,750	0	0

For pulling and rebuilding the "Somerset Arms" public-house, Fulham-road. Mr. W. E. Williams, architect:—

Marr (accepted)

For the erection of a mission-room at Knowbury, Shropshire. Mr. Edward Turner, architect:—

W. Howell, Tenbury	£960	0	0
James Hine, Ludlow (accepted)	875	0	0

For alterations and additions to 54, City-road, for the Finsbury Central Club, Limited. Mr. G. Treacher, architect. No quantities:—

Hogben & Co.	£496	0	0
Smith	490	0	0
Chapman	483	0	0
Porter	440	0	0
Marshall	434	0	0
J. O. Richardson	433	0	0
Harris	433	0	0

For the erection of a pair of semi-detached villa residences, Gunnersbury. Mr. J. Coverdale Bilton, architect:—

C. Rogers, Turnham-green	£1,110	0	0
E. Wildman, Chiswick	1,100	0	0
J. J. Osborne, Turnham-green	1,095	0	0
H. J. Whitman, Chiswick	1,034	0	0
W. G. Gibbons, Turnham-green	837	0	0
C. Bailey, Hammersmith	574	16	4
C. Wort, Shepherd's-bush*	512	0	0

* For drainage, bricklayer's, mason's, and slater's work only.

For additions and alterations to "The Warren," Lancing, Sussex, for Mr. E. Solss. Mr. Fred. W. Hyde, architect:—

R. C. Blaker, Worthing (accepted)	£550	0	0

For general repairs, painting, &c, to "The Warren."

W. Sendall, Brighton (accepted)	£110	0	0

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